

COAL AGE

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DEVOTED TO THE OPERATING, TECHNICAL, AND BUSINESS PROBLEMS OF THE COAL MINING INDUSTRY

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New Roads to Profits?

ECONOMIC crystal-gazing is never more fascinating than when industrial depression makes business men view tomorrow as a darkly curtained doorway to an uncertain future. With an industry circumstanced as bituminous coal has been for the past decade, intensive speculation on what is ahead becomes imperative. In making future trends the major theme of its recent convention, the National Coal Association showed keen conception of the fundamental problems of its membership.

BITUMINOUS COAL has had more than its share of gloomy critics to cheer its dark days. Discussion at Detroit, however, was the antithesis of the counsel of despair. There was little blinking at the facts which have made defeatism palatable to many weary captains of the mines. The courageous outlook expressed was born of confidence in resources for leadership within the industry itself and belief in yet imperfectly developed external possibilities.

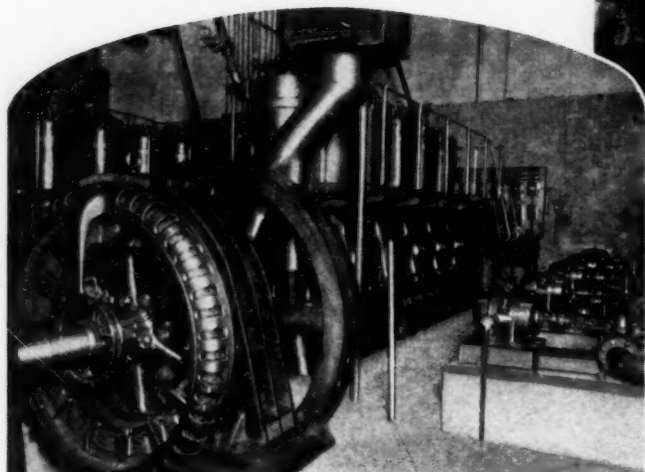
ONE such possibility—touched upon by several speakers at the convention—is the widening of the sphere of the coal producer to take in the manufacturing of byproducts. The suggestion is not new: to many in the industry the idea appears too fantastically

impracticable for consideration. But the fact that this suggestion was sounded so many times at the Detroit meeting by men who have been studying the causes of failures and successes in other fields of business activity is too significant for offhand dismissal.

STRESSING manufacturing possibilities implies no belittlement of coal as a fuel. Coal still remains the chief source of industrial energy and its big job is still that of the largest and most dependable supplier of power and heat. But the record of the past ten years has proved that that job no longer absorbs developed mine capacity. When industrial consumption will again force the production curve sharply upward is an unanswered question.

WHY hang the future on that answer? Why feel, as so many do, that there is nothing left for the industry but to wait until outside interests decide its fate—especially since profits of manufacturing generally greatly exceed those realized on the production and sale of raw materials? Why not a more active drive to broaden the uses of coal both as a fuel and as a raw material for manufactured products? New roads to profits are not discovered by somnolent armchair explorers.





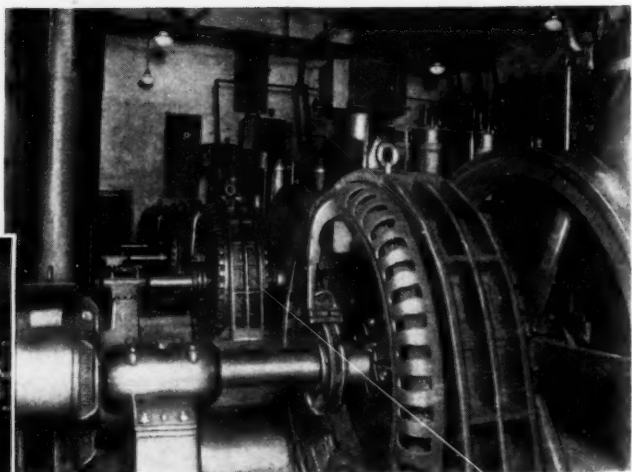
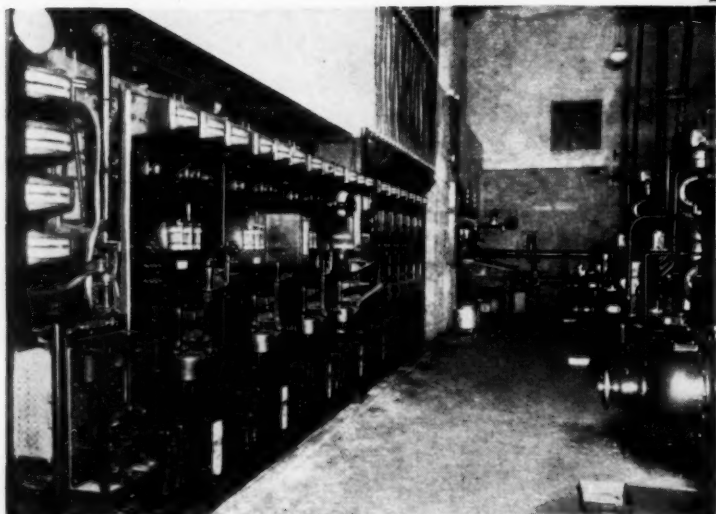
One of the Four Generating Units and the Five Circulating Pumps



The Diesel Plant Is at the Extreme Right and the Shaft Headframe at the Upper Left



An Oil Shipment Spotted Beside the Plant for Pumping to the Storage Tanks, Which Are Located Behind the Cooling Tower at the Right



Showing the Four Generators. Exciters of the Three Units in the Background Are Hid by the Exhaust Vent of the First Unit. Note an Intake Filter in the Upper Center

The Engine Controls Are Close to the Switchboard

DIESEL PLANT

+ Generates Power for Price Hill

By J. H. EDWARDS

Associate Editor, Coal Age

A SURVEY of internal-combustion oil engine installations generating power at the mines in 1925 listed, exclusive of equipment installed for standby duty and operation only in case of failure of line power, 24 such engines with a total capacity of 2,567 hp. (*Coal Age*, Vol. 27, p. 747). The present year is marked by the installation of a plant with a capacity of 1,440 hp.—the largest Diesel installation in the country erected to furnish power exclusively for coal mining. This plant, put into service last May at Price Hill, Raleigh County, West Virginia, furnishes power for operating the Sewell seam shaft mine of the Price Hill Colliery Co. Capacity operation for the mine is approximately 33,000 tons per month.

Complete electrification, rather severe grades for gathering locomotives, and a continuous pumping load are factors which contributed materially to a high cost per ton for purchased power when that cost was matched against the average for other southern West Virginia mines. Although the net power cost for purchased power—averaging about 1.6c. per kilowatt-hour—was close to normal, considering the amount of power used and the rate schedules in effect, a service charge of \$1.50 per kilowatt per month of 15-minute maximum demand, running approximately \$1,200 per month, led the Price Hill management to engage a well-known firm of consulting engineers to look into the situation and make recommendations with respect to the construction of a private power plant.

The report of the consultants, made in 1927, favored the use of Diesel engines over steam and indicated that there would be a small saving over purchased power. Although a steam plant would absorb considerable bone and "bone" now going to refuse banks, the water sit-

uation turned the scales in favor of oil. The creek upon which the property is located goes dry during seasons of light rainfall and the mine water would require thorough treatment before it could be used as boiler feed. Diesel engines also require a scale-free water for use in the cooling system, but the quantity needed is small. The total cost of the Diesel plant (including building, oil-handling and storage equipment, cooling tower, and small treating plant) was in the neighborhood of \$150,000, as compared to an estimated cost of \$190,000 for a modern steam plant.

The Diesel installation consists of four 360-hp. vertical engines, each directly connected to a 300-kva. 2,400-volt generator and all housed in a building 40x60 ft. Engines and generators were made by Fairbanks, Morse & Co. The former are two-cycle Model 32, Style VA, six-cylinder, 14x17-in., 257-r.p.m. The generators have direct-connected 10-kw. 125-volt exciters and are equipped with wide bases, which make it possible to slide the stator over to facilitate repairs or inspection of either stator or rotor without disturbing the bearing pedestal next to the exciter.

Plant control is centered at a switchboard consisting of four generator panels and six feeder panels, and equipped with Tirill voltage regulator, synchroscope, watt-hour meters, and graphic totalizing meter. The switchboard also carries the indicating units of four electric pyrometers; each unit has a six-point selector dial for reading the exhaust temperature of any cylinder. Engine speeds can be adjusted by hand wheels on the governor ends, which are situated close to the switchboard. Totalizing flow meters are installed in the fuel oil and lub-

ricating oil lines; these and the electrical instruments afford a complete record of performance.

Other equipment in the building consists of five small centrifugal motor-driven water circulating pumps and compressed air equipment for engine starting. Air intakes to each engine are fitted with sectional screen filters mounted on a level with the tops of the cylinder heads. The engines exhaust into individual concrete boxes located under the floor beside the respective foundations. They are drained through the building foundation with 4-in. tile and vented by large pipes through the roof.

ENGINES are cooled by a closed system; the jacket water is circulated through banks of tubes located near the bottom of the cooling tower, and raw mine water dripping down over the tower baffles and onto the tubes does not mix with the jacket water. The unit is five-bay cooling tower furnished by the Cooling Tower Company of America. The jacket water circulates through "Bentube" sections of admiralty metal made by the Griscom-Russell Co. With sections of this construction, scale which might form on the outside of the tubes can be broken off by turning steam into the tubes. The heads are anchored together by long tierods, so that the expansion caused by steam temperature will bow the tubes sufficient to crack the scale. So far there has been no sign of scale formation on the outside.

Adjacent to the cooling tower, which is about 75 ft. from the engine house, there is a covered concrete tank divided into two compartments where the make-up jacket water is

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BITUMINOUS INDUSTRY

+ Co-ordinates Allied Forces

At National Coal Convention

GROUP ACTION on the part of every one associated with the bituminous coal industry was the theme of the thirteenth annual meeting of the National Coal Association, held at the Book-Cadillac Hotel, Detroit, Mich., Oct. 15-17. Coal company executives and representatives of associated industries showed as never before their keen interest in a common problem. Merchandising, co-operation among interdependent groups, prospects of expansion in the face of competition from substitute fuels, and other questions connected with the conduct of the bituminous industry were examined in the light of the greatest benefit to the greatest number.

In furtherance of the idea of co-operation, the Coal and Coke Committee of the Southern Freight Association, the fuel committee of the National Association of Purchasing Agents, and the Coal, Coke, and Iron Ore Committee of the Central Freight Association Territory held concurrent meetings. Joint sessions of committees of the National Coal Association, the National Association of Purchasing Agents and the International Railway Fuel Association also were held, and the Committee of Ten—Coal and Heating Equipment Industries met to consider common problems. As an added attraction, eleven stoker manufacturers and one chemical company offered their products for the inspection of the delegates.

Aside from organization affairs, safety and coal classification were the topics discussed at the first formal session in the morning of Oct. 15, with F. F. Taggart, Massillon, Ohio, president, Spruce River Coal Co., in the chair. Further revision of the mining laws in Alabama, will be necessary to cope with changing conditions brought on by increased mechanization, if safety, lawfulness, and economy are to be served in that class of work, said W. B. Hillhouse, chief, Alabama Department of Mines, whose paper was read by D. A. Thomas, Birmingham, Ala., president, Montevallo

Coal Mining Co. Mr. Hillhouse discussed falls of roof, underground transportation, and ignition of gas from the standpoint of safety, and said that medical costs and compensation paid in non-fatal accidents cost the operators in Alabama 3.2c. per ton in the first nine months of 1930. This figure did not include time lost by the injured.

Prevention of accidents still does not get the attention that rescue and rehabilitation work after disasters does, asserted E. W. Smith, chief, Ohio Division of Mines. He emphasized the importance of management in safety work. R. M. Lambie, chief, West Virginia Department of Mines, said that the tonnage per fatality in West Virginia had been reduced 62,000 in the ten years preceding 1930, and that a further reduction of 10 per cent had been made in the present year, as compared to the same period in 1929. He suggested that the association appoint a committee to meet with members of the Mine Inspectors' Institute twice a year on safety. "Education, supervision, and discipline" is Maryland's slogan in accident prevention, said J. J. Rutledge, chief mine engineer, Maryland Bureau of Mines, whose paper was read by A. B. Stewart, president, Davis Coal & Coke Co.

Classes of coal will in some cases have to be established arbitrarily, said T. W. Harris, Jr., Wilmington, Del., division purchasing agent, E. I. duPont de Nemours & Co., in discussing the work of the coal classification committee sponsored

N.C.A. RE-ELECTS OFFICERS

All of last year's officers of the National Coal Association were re-elected at the thirteenth annual meeting, held in Detroit, Mich., Oct. 15-17. The roster is as follows:

President—C. E. Bockus, New York City, president, Clinchfield Coal Corporation.

Vice-Presidents—W. H. Cunningham, Chicago, president, Truax-Traer Coal Co.; Rice Miller, Hillsboro, Ill., president, Hillsboro Coal Co.; J. W. Searles, New York City, president, Pennsylvania Coal & Coke Corporation; J. F. Welborn, Denver, Colo., chairman of the board, Colorado Fuel & Iron Co.

Treasurer—W. D. Ord, Landgraff, W. Va., president, Empire Coal & Coke Co.

Executive Secretary—C. B. Huntress, Washington, D. C.

Charles A. Owen, New York City, president, Imperial Coal Corporation, succeeded H. F. Bovard, Greensburg, Pa., president, Keystone Coal & Coke Co., as a director of the association, and Charles O'Neill, New York City, vice-president in charge of sales, Peale, Peacock & Kerr, took the place of Rembrandt Peale, St. Benedict, Pa., president of the company.

by the American Society for Testing Materials and other organizations. "However," he added, "the characteristics of the various classes and the criteria for their differentiation must be based upon the natural scheme of development of coal."

After preliminary studies have been made, the future development seems to lie along the following lines: study of the characteristics of the coal already established, or which can be established, that bear on the various uses and marketing practices now in effect; further extension of uniform laboratory tests for coals of various characteristics; simultaneous comparison and study of proximate analysis, heating value, ultimate analysis, and physical properties of coal on any moisture and purity basis; establishment of classes based on the natural scheme of development of coal from a physical, chemical, and geological standpoint; development of a scientific method of classification; and the application of this classification so that it can be used by industries for their individual problems.

"The classification of coal is aimed directly at the elimination of waste." Both coal producers and coal consumers waste considerable sums and duplicate an enormous amount of work each year in attempting to direct coals into their proper channels. In addition, "it is undoubtedly a fact that lack of knowledge as to the relative values of coal for various uses has quite often created an improper comparison of selling prices between various coals and an improper purchase and sales cost."

ANALYSIS of coal is a minor consideration of the purchasing agent, who often is tempted by lower priced coals to change his requirements or run expensive tests with the coals available. This is particularly true of late, observed Mr. Harris, since it has been shown that the proper sizing of coal or many other factors not developed through analysis may influence the usability. Proper classification, limited by geographic locations, should narrow down the logical source of supply and give the buyer and the coal producer a lower cost in obtaining his proper requirements. Proper classification also should narrow down the consuming points which the coal operator may reach and enable him to enter it at the least expense. In addition, knowing the market's requirements, the producer would be able to make his



C. E. Bockus

outlay for preparation go farther than at the present time.

At the local association luncheon meeting on Oct. 15, presided over by H. R. Hawthorne, New York City, secretary, Pocahontas Fuel Co., addresses were made by J. E. Butler, Stearns, Ky., general manager, Stearns Coal & Lumber Co. (read by R. E. Howe, Knoxville, Tenn., secretary, Southern Appalachian Coal Operators' Association); W. E. Davis, Lexington, Ky., president, Davis Collieries Co.; W. A. Ellison, Knoxville, Tenn., vice-president, Mahan-Ellison Coal Corporation; R. S. Graham, Norton, Va., vice-president, Wise Coal & Coke Co.; R. H. Morris, Ansted, W. Va., general manager, Gauley Mountain Coal Co.; M. W. Stark, Columbus, Ohio, vice-president, Red Jacket Consolidated Coal Co.; J. Wm. Wetter, Philipsburg, Pa., general manager, Madeira Hill Coal Mining Co.; R. H. Sherwood, president, Central Indiana Coal Co.; D. A. Thomas; and C. E. Bockus.

In his discussion of local association activities, Mr. Morris said: "It would appear that the time is at hand when we must find new uses for coal or, perhaps better, resurrect old uses, and adopt new methods in order to expand the market for coal." The trade-practice movement and merchandising activities are hampered by

the freight rate situation and the diversity in the kinds of coal produced. Mr. Sherwood remarked. Touching on President Hoover's statement at the American Federation of Labor convention in Boston, Mass., Oct. 6, that if the regulatory laws be at fault in allowing destructive competition in the coal industry, "they should be revised," he said that some kind of regulation might be of benefit, and that loose thinking on the subject may obscure the benefits which might accrue. Mr. Bockus voiced the opinion, however, that the question of regulation cannot put aside the law of supply and demand. Public utilities have been successful under regulation, he said, but they have had the advantage of a steadily expanding market. The real problem in the coal industry is to adjust production to demand.

CO-OPERATION between the coal industry and the heating-equipment industries through the agency of the Committee of Ten—Coal and Heating-Equipment Industries and the place of the automatic stoker in the present merchandising plans of the coal industry were the themes of the second formal session, in the morning of Oct. 16, with W. D. Brennan, Salt Lake City, Utah, president, Utah Fuel Co., in the chair. The discussions on the stoker problem are treated on page 673 of this issue of *Coal Age*.

Terming the Shipstead anti-injunction bill as primarily class legislation, Attorney Henry Adamson, Terre Haute, Ind., who addressed the afternoon session presided over by H. L. Findlay, Cleveland, Ohio, vice-president, Youghiogeny & Ohio Coal Co., asserted that the proposed measure invaded the field of state legislation and "recognizes only the coercion of the employer." Two constitutional questions are presented by the bill, one of which—the right of an employer to make membership in a union a condition of employment—has been upheld by the courts, the most recent decision being in the present year in the Supreme Court of Massachusetts. The second constitutional question is concerned with the right of Congress to limit the jurisdiction of a court of equity to the extent proposed in the present bill.

The rest of the afternoon was given over to a forecast of the future of the industry. "What's Ahead in Research" was discussed by Dr. Thomas S. Baker, president, Carnegie Institute of Technology. The

outlook in production was analyzed by John B. Dilworth, E. V. d'Inviliers Engineering Co., Philadelphia, Pa., and the banker's viewpoint was outlined by James L. Walsh, vice-president, Guardian Detroit Bank, Detroit, Mich. These addresses are abstracted on page 663 of this issue of *Coal Age*.

THE trade-practice movement was the first subject considered at the closing session, Oct. 17, presided over by A. J. Moorshead, Chicago, president, Madison Coal Corporation. Following the report of E. C. Mahan, Knoxville, Tenn., president, Southern Coal & Coke Co., and chairman of the trade-practice section of the Market Research Institute of the association, Abram F. Myers, former Federal Trade Commissioner, summed up the "Latest Developments in the Trade-Practice Movement." Asserting that he still believed, as he did a few years ago, that the coal industry along with some other mineral groups should be exempted from existing anti-trust laws and special provisions made for their operation with protection to the public, Mr. Myers conceded that the history of government regulation did little to make it acceptable to business in general. This criticism "is nowhere better illustrated than in recent developments in trade-practice conference work."

After expanding the trade-practice conference work, the Federal Trade Commission, said its former chairman, suddenly abandoned its helpful policy of co-operation by announcing commission-made revisions of the trade-practice conference rules. So serious were the effects of this change of front that the industries concerned were recently impelled to form a protective alliance, out of which grew the Congress of Industries which recently held a meeting of protest at Niagara Falls.

According to press reports, the Commission based its action on representations made to it by the Department of Justice that trade-practice conference rules were either contrary to the Sherman law or were being applied in an unlawful manner. "Recent developments," declared Mr. Myers, "tend to discredit this theory, because the Department of Justice in framing the consent decree in *United States v. Standard Oil Co. of California et al.*, in the United States District Court at San Francisco, has, in effect recognized the

validity and left wholly undisturbed a trade-practice rule of the petroleum industry that is possibly the most sweeping and questionable ever received by the Federal Trade Commission under its procedure."

Rule 17 of Group II of the petroleum industry provides in substance "that all refiners and all distributors, jobbers, and wholesalers should post, at all points of delivery, the prices at which they would make delivery of gasoline and other petroleum products and that the operators of service stations, etc., should post the prices at which such products would be sold. It also provides that no seller should make any deviation from his posted prices 'by means of rebates, allowances, bonuses, concessions, benefits, unusual credits, scrip books, or any plan, device, or other scheme which may directly or indirectly permit the buyer to obtain gasoline or kerosene at a lower net cost to him.'" In other words, observed Mr. Myers, the rule is so sweeping as to preclude any deviation from the posted prices.

"The fact that the California decree did not enjoin any practices prescribed by the rule, but only practices which, if carried on under cover of the rule, were a clear abuse of it, establishes the validity of the rule and affords a valuable precedent" in eliminating unfairness without fear of law violation. With the validity of trade-practice rules established by the California decree, the only handicap of the procedure for the elevation of business confidence is the "uncertainty and doubt" with which it has been surrounded by the Commission itself.

"IN VIEW of the cloud of uncertainty which envelops the attitude of the Commission and the future of the trade-practice conference work," the holding of a conference at present by the bituminous industry would be inadvisable. However, said Mr. Myers, "to the extent that a code of business ethics will help you in the solution of your problems, I bid you formulate the code in your own way, under the advice of your own counsel and without reference to any existing commission or bureau. You have the assurance that the public is aware of the conditions in your industry, and will approve all fair and reasonable measure to improve those conditions."

The common interests of the railroads and the bituminous coal industry were the subject of papers

by T. Duff Smith, Cleveland, Ohio, lake forwarding agent, Canadian National Railways; J. D. Francis Huntington, W. Va., vice-president, Island Creek Coal Co.; and Conrad E. Spens, Chicago, executive vice-president, Chicago, Burlington & Quincy R.R., abstracted on page 674 of this issue of *Coal Age*.

"The deflationists have replaced the 'New Era' enthusiasts of last year in the saddle of American business, and through the tragic failure of intelligent progressive leadership during the crucial months, since June, we are now faced with the dangers of reckless and uncontrolled deflation, which are more serious than those of excessive inflation," said Virgil Jordan, New York City, economist for the McGraw-Hill Publishing Co., in his address on "The Business Background of the Coal Market." As the fourth quarter begins, hopes for business recovery in the present year have been disappointed, and such recovery apparently has been deferred until spring or later in 1931. Little hope should be held out of assistance from the government, and the business system must meet the crisis by itself and demonstrate its capacity for constructive action by individual leadership and organized co-operation from the bottom up in each industry and by refusing to surrender to the pressure for deflation.

COAL is in a stronger position to resist depression because, like textiles, it has several years of deflation behind it. "But more than any other industry except electric power and railroads, its marketing problem is determined by the background of general business conditions, and by the changes in production and marketing methods which are going on in all lines of industry and trade. It can cope with these changes only by refusing to surrender to the prevalent fatalism and resignation of a deflation period and bringing vigorous individual initiative and organized effort to bear toward maintaining an orderly market through more economic price practices, improved selling organization, and better information on coal distribution; toward increasing the flexibility and stability of the market by vertical and inter-district integration; toward expanding the market through development of servicing activities and intensive research to develop new uses for coal and coal products."

AFTER COAL, WHAT?

+ Clearfield Company Says "Timber," and Plants Trees

IN THE early days, with the acquisition of mineral acreage many of the coal companies came into possession of large tracts of forest land. Though these companies little realized it at the time, they held in the timber a resource which to themselves and to the nation was of importance second only to the coal. Looking back in retrospection, it would have been a happy combination if the production of lumber from surface lands and of coal from underground could have been carried on simultaneously under one management. The consolidation would have been advantageous in that coal mining is a main dependent of the lumbering industry for the supply of timbers with which it supports roofs over the underground workings. Economies in production might have been realized because both occurred on the one property. Still more important from the economic aspect, the forests might have been maintained as an inexhaustible resource, though drawn upon continuously for a yield of lumber, with the selective methods of cutting.

This proposition of dual interests verges close to the idealistic and was viewed as impracticable for those days. Mining was for mining men and lumbering for lumber men. Also, was not the supply of timber for mining and other commercial uses practically inexhaustible?

The frame of this thinking is important to a lucid comprehension of the aims and motives of the Clearfield Bituminous Coal Corporation, subsidiary of the New York Central R.R., in its forestry program covering surface lands in central Pennsylvania.

This corporation and its predecessor, the Clearfield Bituminous Coal Co., witnessed much ruthless destruction of their forests by lumbering interests to which the standing timber was sold at nominal prices. Little significance was attached to such destruction because the remaining timber supply appeared ample. That was prior to 1900, when the railroad company acquired control. In the years following, however, mine timber, which at first was bought at a cost of little more than that for the labor of cutting it, was becoming increasingly expensive and difficult to obtain.

In 1920 a forestry department was established for the purpose of con-

Adequate Seasoning Is Assured
by Keeping a Year's Reserve
of Timber



Dozens of Seedlings Are Planted
for Every Tree Felled

serving the standing timber and making new plantings on some 24,000 acres of surface land. A portion of this acreage was covered with fully matured timber, other portions with immature second growths, and the remaining areas were partially or entirely barren. In the last ten years more than four million seedlings have been set out, and the entire acreage is now covered by timber in all stages of growth, from mature trees to 2- to 3-year-old seedlings. The planting has covered barren tracts which, combined, total an area of 4,136 acres. This area does not represent the entire acreage reforested, because many of the trees have been planted to fill in barren or thin spots in the midst of natural growth.

As at first visioned, this forestry program was intended as a provision to insure a supply of timber for mining purposes during the life of the coal properties. That viewpoint has since been altered. By a sustained-yield plan, now functioning, timber demands of the coal operations are filled by selective cutting which does not detract from the ultimate value of the forests.

An estimate places the present value of the timber at about \$1,500,000. When the coal is completely gone, the timber will have an estimated value of \$5,000,000 to \$7,000,000. Under the plan, the timber will remain a perpetual resource of constantly increasing value. All of this



In the Sawmill at Clymer

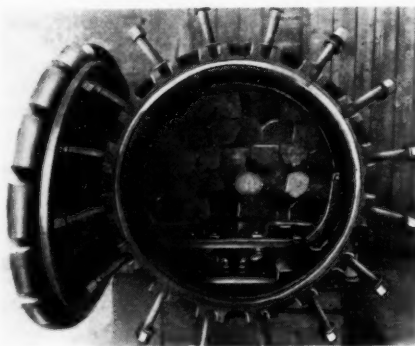
is but another way of stating that the company has been planning and acting to restore its surface lands to much the same state of its original verdure. It would then have the opportunity, entirely missed by coal companies in the past, of profiting from timber resources, though the coal be gone.

At first, seedlings were obtained from the state nurseries. In 1924 the company established its own nurseries, consisting of $7\frac{1}{2}$ acres near Clymer, Pa., in which are grown more than the number of seedlings required in the reforestation work. The surplus is sold to outside interests. This nursery is in charge of a graduate forester who also acts as a consultant on forestry questions.

Pines of the hard varieties, it has been found, are the most desirable of the woods which give satisfaction in underground service and at the same time thrive best in the soil available for planting. When treated, they are excellent for mine ties and they serve well for mine timbering. The varieties planted, in the order of their relative importance, are: (1) pitch pine, (2) Scotch pine, (3) Banks pine, 4) red pine, and (5) white pine. The first three of these are ideal for high elevations, where the soil is light and dry. Such trees as the spruces are used for filling in where undergrowth is thick and little sunshine penetrates.

Seedlings are set out at intervals of 5 ft.—which is much too close for normal forest growth—because close plantings crowd out underbrush and minimize the fire hazard. After about fifteen years these plantations can be thinned out and the cuttings made into mine ties and props. Otherwise, it is a case of the survival of the fittest.

The company has no qualms about cutting fully matured trees, knowing that for each such tree felled it has planted dozens of seedlings. Protection of the forest is aided by the removal of undecayed fallen timber, by



This Retort Treats 100 Ties at a Time Using Wolman Salts

the establishment of fire trails, lanes, and roads, by the erection of fire towers, and by the employment of fire patrols during fire seasons. The company protection system is connected by telephone to the state fire tower system. One factor which

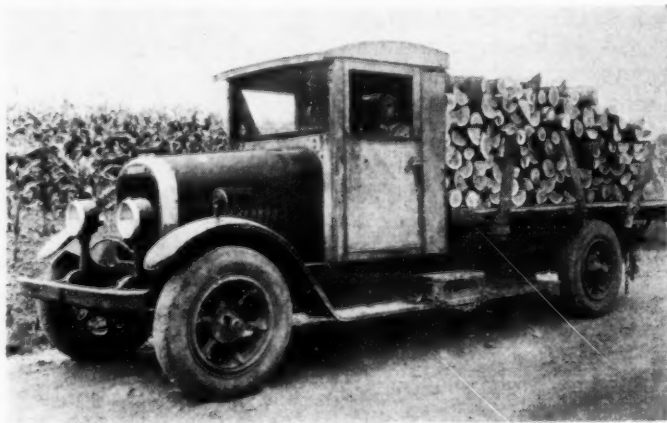
should go far to encourage investment in woodland enterprises is the availability of forest-fire insurance, and the plantations of this company are thus covered. The Republic Fire Insurance Co., Pittsburgh, Pa., issues a policy at a basic premium rate of 2 per cent, with credits and charges for specific conditions and practices.

In addition to the regularly established patrols for the prevention of forest fires, the forester and men in authority at the mills and in the woods are state appointed fire wardens. Mine superintendents also are state-appointed fire wardens whose duties are to look after the plantations located close to the mines.

Reforestation is encouraged in Pennsylvania by a recent act which considers certain timber-bearing lands as auxiliary forest reserves and, as such, assesses them at only \$1 an acre. The tax burden on this land does not exceed 5c. per acre. This schedule is made feasible by a deferred tax charge of 10 per cent of stumpage value applicable when the timber is cut.

IN SOME quarters, it is held that the planting of seedlings is an almost useless expense and waste of effort, and that forests will reproduce themselves. Nature's powers of reproduction are not denied by the planting practices of this company, which, however, holds that nature can be assisted in her attempts at propagation of tree growth. Natural growth is largely relied on to continue the areas already heavily wooded, but complete coverage is aided by planting. There are denuded areas, such as the slopes contiguous to mine plants, which will not properly take care of themselves. Unless such areas are planted, trees will be slow to appear or may be scrubby. Then, too, there is the point of adapting to the region foreign

Props Are Trucked From the Woods to the Mine Plants as Needed

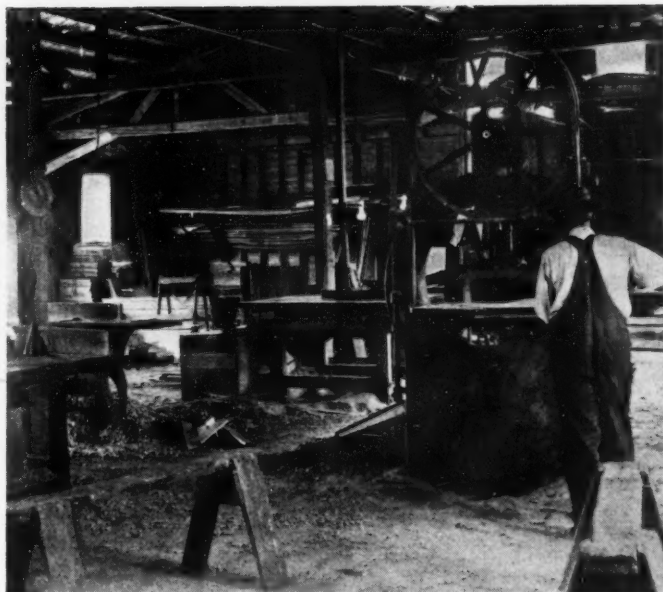


species, which are more profitable than those that are indigenous.

An example of this is the planting of Banks pines. These trees, which are not native, have rapid vertical growth and one day will supplant the spruce now imported from the Northwest for use as transmission-line poles.

The largest single tract consists of 15,000 acres at Grassflat, in Clearfield and Center counties. North of Patton, in Cambria and Clearfield counties, is a tract of 4,500 acres, and at Gazzam, in Clearfield County, there is one of 1,500 acres. The remaining 3,000 acres are made up of smaller tracts largely in the vicinity of mines.

At Clymer, which is near Indiana, Pa., and the center of mining operations, are located a mill pond for the storage of logs, a completely equipped sawmill, a planing mill, a finishing mill, and also a treating plant. Not far from this plant group is the company's central machine shop, where, among other things, mine cars are built of wood shaped in the finishing mill. In this mill all the pieces going into the body of the car are finished to size and delivered to the machine shop ready for assembling. In the finishing mill also mine doors are completed ready for hanging under-



Interior of the Finishing Mill

on two edges and one side. It is laid with about a $\frac{1}{8}$ in. clearance for ventilation and prevention of rotting of the joists. It is given pressure treatment, as also are the drift timbers, trolley guards, timbers, lagging, and most of the mine ties.

Functioning behind the operation of these plants is the idea of keeping stores of timber and lumber on hand

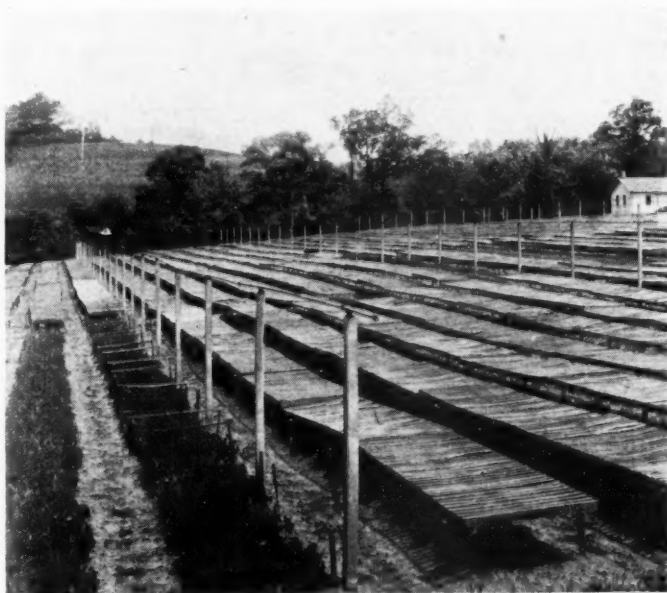
wood is not frozen but is in best condition for handling. The management has learned to calculate in advance, within a few thousand feet, how much timber the mines will need in a coming year.

Eight men are employed at the Clymer plant and divide their time between sawing and milling and preservative treatment of timbers. Permanent timber sets used underground are framed by these men at the mill, ready for erection.

In near-by woods a crew of three to six men is maintained at felling trees and cutting props. In this work a team of horses and two trucks are employed. They are used for hauling logs in the winter and for the purposes of planting in the summer; also for hauling lumber supplies to the mines.

Most of the large-scale logging is done in the Grass Flat tract, which is about 90 miles northeast of Clymer. Here about 22 men are employed in logging operations and in rough milling. Logs are gathered by two teams of horses and are hauled from the woods by two gasoline locomotives over a narrow-gage track which has a total length of about 20,000 ft. A small roughing mill is in operation at this tract, where a limited number of ties and similar rough pieces are turned out. Logs and surplus lumber from this operation are shipped by railroad for storage and use at the Clymer plant.

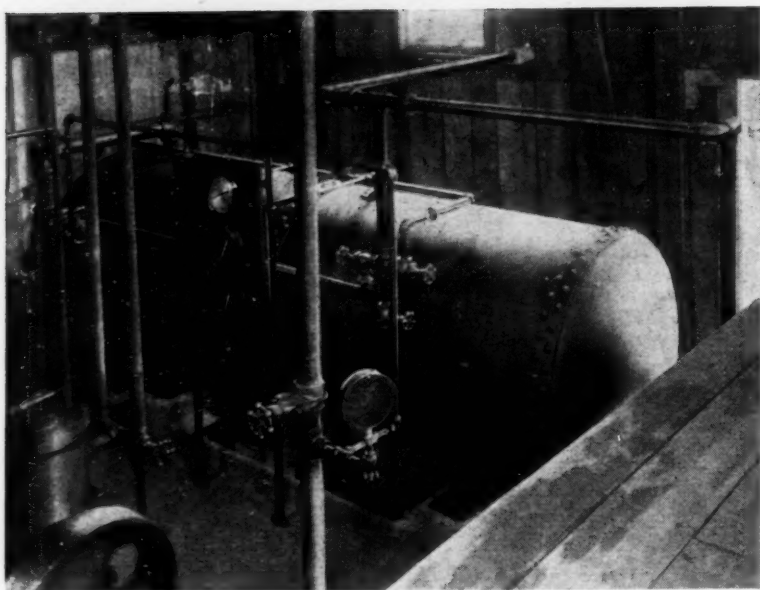
Despite the abundance of its supply of timber for mine use, the corporation makes a regular practice of treating ties and permanent timber used in the mines. To conserve its timber supply is only one reason why



The Company Grows Its Own Seedlings

ground. Incidentally, these doors are painted with a solution of Wolman salts ($\frac{1}{2}$ lb. of salt to 10 lb. of solution) which is applied with a brush. In this plant also are made sprags, safety blocks, trolley poles, switch boxes, window and door casings, inside house finish, porch flooring, and other items. The porch flooring is 1-in. oak, 4 in. wide, surfaced

about one year ahead of the demands of the mines. This provision allows adequate seasoning and permits the scheduling and co-ordinating of logging, milling and preservative-treatment operations in line with weather conditions. An attempt is made to do most of the milling and preservative treatment in warm weather, when fewest delays are encountered and the



Treated Timbers Are Subjected to Pressure of 186 Lb. for 1 to 1½ Hr.

this practice is followed, more important being the saving in labor attached to the replacement of these pieces. The decision to install a treating plant was aided by the influence of the railroad company and by the experience of the coal company with drift timbers and lagging which were treated by dipping. Occasion was had for removing some of these after fifteen years of service. On examination they were found to be in an excellent state of preservation. Under similar conditions untreated timbers would have lasted a maximum of about six years.

Treatment is by the pressure system using equipment furnished by the United Wood Treating Corporation of Chicago. Wolman salts are used

exclusively as the impregnant. The pieces are subjected to an initial vacuum of 26 in. for about 30 minutes, followed by a pressure of 186 lb. per square inch applied for 1 to 1½ hours. During the process, the retort atmosphere and the solution are kept at a temperature of about 130 deg. F. Pieces are wheeled on small narrow-gauge cars into the retort, which is 18 ft. long, 4 ft. in diameter inside, and will hold three cars of ties (about 100 ties), each 5 in. x 6 in. x 5 ft.

With this system, the penetration amounts to 10 to 12½ lb. of solution per cubic foot. The concentration used for ties is about ½ lb. of salts to 10 lb. of solution; that for drift timbers is ¼ lb. of salts in 10 lb. of solution. Treatment of the soft wood

takes about 1½ hours and that of hard wood about 2 hours.

Three standard sizes of ties, all 5 ft. long, are used in the mines of this company. In cross-sections these measure 4x5 in., 5x6 in., and 6x7 in. respectively. The two largest sizes are used on permanent haulage roads and invariably are treated. They are made of any kind of sound hard wood or pine. Ties for room entries are of the smallest size. They are invariably made of oak and are never treated. Steel ties are laid in room track.

All mine ties are sawn. The sawn tie has been adopted as a standard because it is felt that, in addition to giving a longer life and being more readily susceptible to treatment, it makes for economy in the job of lifting and preparing bottom for mine tracks.

According to an estimate of the Clearfield Bituminous Coal Corporation, production of one ton of coal from its mines requires the consumption of 4 board feet of lumber. This quantity includes the timber and lumber incorporated in all surface structures, plant buildings, and dwellings.

The company has been doing considerable conveyor and scraper mining. It has independently determined what is known as a fact, that mechanization has served to decrease the consumption of timbers in mining. In addition, it has found that mechanization also demands a higher quality of prop. In this respect the company is fortunate in being able to supply its own needs to assure quality. Two grades of props are requisitioned, one for ordinary use and the other for special purposes.



Two Grades of Props Are Furnished; One for Ordinary Use and One for Special Purposes

WHAT'S AHEAD

+ In Bituminous Coal Industry Forecast At Annual Operators' Convention

OPTIMISM as to the future of bituminous production and recommendations that coal producers merge with the chemical and processing industries to participate in every possible source of profit were intermingled at the session on future trends of the industry at the thirteenth annual meeting of the National Coal Association, Detroit, Mich., Oct. 16.

An early resumption of the upward trend in bituminous consumption was predicted by John B. Dilworth, E. V. d'Invilliers Engineering Co., Philadelphia, Pa., who declared that it "seems a reasonable expectation that the annual demand for bituminous coal will approximate 600,000,000 tons by 1934, 700,000,000 tons by 1937, and 800,000,000 tons by 1940." The immediate cause of the depression in the coal industry is overdevelopment, Mr. Dilworth asserted, and one of the most potent outside factors in this condition has been the stoppage in the growth of consumption in the last decade.

Two causes have operated to bring about this stoppage; greater efficiency in the use of coal and the inroads of substitutes. Reduction in coal consumption per unit of power, in the opinion of Mr. Dilworth, has now reached a point, however, where further economies will be relatively small and costly. As a substitute for bituminous coal, anthracite is waging a losing fight, because of the rising costs of hard-coal production. But oil, since 1920, has captured 11 per cent of the 16 per cent of the country's total energy production lost by coal. While there is no immediate prospect of decreasing output, the cost of producing oil is rising, and more and more is being made into

fuel for internal-combustion engines. With the increased recovery of gasoline, fuel oil, which is a byproduct, will become scarcer, and as the cost of crude increases, refineries will have less desire to sell their product in the form of oil fuel.

Natural-gas distribution has increased sharply recently. Pipe lines are under construction or are projected from the Mid-Continent field to Central and Eastern states with a capacity of 1,325,000,000 cu.ft. of gas daily. However, said Mr. Dilworth, if these were all built and operated at capacity, their annual gas delivery would amount to only 18,000,000 tons of coal, or 3.5 per cent of the present bituminous output. In addition, it is not certain that this quantity of gas will be delivered.

Estimates indicate that the twin 24-in. 1,000-mile pipe lines from Texas to Chicago must yield the owners about 40c. per 1,000 cu.ft. at Chicago before any management profit can be realized. And 40c. gas corresponds to a medium-grade coal at a retail price of \$10 a ton, which "is far above the profitable price for good coal in that city."

Bankers have an interest more than sentimental in a great variety of businesses, said James L. Walsh, Detroit, Mich., vice-president, Guardian Detroit Bank. In "looking over the return on invested capital in various industrial enterprises for the first half year of 1930, as compared with a similar period in 1929, we run across some contrasts in performance which should at once excite our curiosity and challenge serious investigation." These are shown in the accompanying table.

"Why should General Motors in 1929," asked Mr. Walsh, "show an

annual rate of return of 34.4 per cent, as contrasted with 11 per cent for U. S. Steel during the same period, or General Motors during 1930 show 22 per cent against U. S. Steel's 7.1 per cent? Is this disparity due entirely to the fact that U. S. Steel is selling staples while General Motors is selling specialties? Is it due to the fact that net profits are magnified to an unusual degree by relatively slight increases in 'value added by manufacture'? Or is it due

Number of Companies	Industry	Annual Rate of Return Per Cent	
		1929	1930
1	Iron and Steel—U.S. Steel	11.0	7.1
31	Iron and Steel—Other....	11.6	6.1
1	Automobiles—General Motors.....	34.4	22.0
20	Automobiles—Other.....	23.8	6.0
20	Chemicals.....	18.8	13.1
14	Drugs and Sundries.....	21.0	6.0
35	Petroleum.....	9.3	5.2
7	Coal Mining.....	3.3	0.9

to the fact that the automobile executive of today is a mighty good merchant, in addition to being an excellent manufacturer?" To dismiss the bad showing of coal by saying too many mines and too many miners "is no answer to a banker who may be expected to loan someone else's money for the possible improvement of an industry."

Despite apparently gloomy statistical trends, declared Mr. Walsh, "resourcefulness and courage in attacking the problems of the industry today may work to the ultimate advantage of all concerned. Even admitting that the economic value of coal is to be confined to utilization as fuel, have we exhausted the possibilities of enlisting the co-operation of those other groups which have a vital interest in solving this particular problem? It would seem that the first thing to do is to determine what other industries have a common interest in solving our problems

on a permanently fair and satisfactory basis; to ask them to foregather with us in a friendly, round-table discussion from time to time with a view clearly defining the position of the coal industry in the economic picture of today; to finding a mutually helpful and profitable relationship with other groups whose prosperity depends on that of the coal industry, and eventually ascertaining a basis upon which the coal industry can perform its useful and indispensable function in the civilized world, in return for which it should—and must—be permitted to earn a reasonable profit on its investment.

"Still assuming that we are thinking of coal solely as a fuel, what are the encouraging and what are the discouraging tendencies in our situation? First of all, I should say that since I first came in contact with the coal industry there has been a decided improvement in the attitude of the industry toward customers, investors, employees, and toward the public generally. Can we not by supremely conscientious conduct of our own affairs in the coal industry gradually win a place in public esteem which shall, by legislative enactment or judicial decision, help to remove some of the heretofore insurmountable obstacles to progress which have barred our way?" President Hoover, in his address at Boston, Mass., Oct. 6, outlined an opportunity for the coal industry to put its house in order and secure its place in the sun.

ANOTHER encouraging feature is the steady decrease in the number of mines and miners during the past five years, evidencing an acceptance of realities and a fading trust in miracles. "The question naturally arises as to whether a series of consolidations might not further improve the situation." Further mergers within a district would only serve to intensify the already severe competition. The more logical plan would be the merger of "producing units selected from several districts, with a view to obtaining better national coverage and corresponding shorter shipment to market."

But thinking of coal merely as a fuel is a needless limitation of the industry's possibilities. While it is not necessary to consider coal solely as a source of other products, the selling of which will bring a new era of prosperity to the industry possibilities along these lines have not been explored to the same extent as in other industries. "This raises the

question as to whether the successful coal companies of the future will not be organized on a 'miner-manufacturer-merchant' basis through vertical integration extending from ownership of coal reserves, operation of mining equipment, processing of coal as a raw material, development of new derivatives and byproducts, creation through market research of demand for the whole family of coal products, and distribution of these products through a modern, efficient, merchandising organization following the straightest possible channels from coal in the ground to the ultimate consumer."

The coal operator as a manufacturer also was touched upon by Dr. Thomas S. Baker, Pittsburgh, Pa., president, Carnegie Institute of Tech-

nology, in a review of research activities here and abroad. "I realize," he said, "that there are many complications to be adjusted when the coal man departs from his traditional work of mining and selling: the finding of markets for the new products, the disarrangement of established methods, the risk of insufficiently tested new processes, the inertia of tradition. But the present condition of business seems to demand the consideration of every possible outlet for the surplus of our mines. It should be noted that other industries are finding it advantageous to purchase and work coal mines. The chemical industry, the coke industry, the fixed-nitrogen industry, the gas industry are drawing their raw materials from mines which they have acquired."



DIESEL Power for Price Hill

(Continued from page 655)

treated. Soda ash and a vegetable compound are added to the mine water and the solids allowed to settle. Theoretically, only an insignificant quantity of make-up water should be required, but the warm jacket water is used also by the engineers for washing hands and other purposes, so that it has been found necessary to add about 1,000 gal. per week.

Fuel oil is stored in two 16,000-gal. tanks located beyond the cooling tower. From tank cars spotted beside the engine house, the oil flows to a rotary pump, located in a near corner of the building, which forces it to storage tanks on higher ground. Third-cut fuel oil of 28 to 30 Bé. gravity from the Cabin Creek district is being used. The rail haul is about 60 miles. At present prices and shipped in tank cars the cost delivered at the plant should not be over 5c. per gallon or \$2.10 per barrel (42 gal.). Oil used for lubrication meets the following specification: Gravity, 25; flash, 430 deg. F.; fire, 480 deg. F.; viscosity at 100 deg. F., 365; viscosity at 26 deg. F., 55; pour test, 30. It is made from "Pennsylvania" crude, which means oil from any state in the Appalachian field. Specifically, the particular lubricating oil now being used was made from West Virginia Cabin Creek crude.

Usual guarantees on engines of

this size as regards fuel oil consumption are 46 lb. per horsepower-hour at full load, 50 lb. at three-fourths load, and 52 lb. at one-half load.

The operating force consists of one man per shift. Three engines are operated at night, at which time the load averages 300 to 400 kw., and all four engines are operated during the day, while the load is 500 to 900 kw. Peaks imposed by the 150-hp. coal hoisting motor have proved too much of an overload for the plant, so at this writing purchased power is still being used to operate the hoist during the day.

Because the shaft is but little over 100 ft. deep, it is not necessary to operate the hoist continuously throughout the day to handle the production; therefore a load-limiting device has been ordered which, according to calculations, will automatically cut the power from the hoist for periods of a few minutes' duration eight or ten times during the day. A meter indicating total plant load will be mounted in front of the hoist operator so that he will not attempt operation when a peak mine load is evident. With the aid of this control equipment it is hoped that the entire load can be carried by the Diesel plant without affecting production. Experience indicates that the peaks should be limited to 1,060 kw. or approximately 110 per cent rated capacity of the plant.

CORRELATE ANTHRACITE SEAMS

+ By Their Evidences of Maceration

By HOMER G. TURNER

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PENNSYLVANIA anthracite beds are derived from a series of ancient swamps which were developed on large base-level coastal plains not far above tide level. Each swamp formed a vast deposit of peat which was later flooded and buried under layers of sediment. On this sedimentary covering another swamp developed, in turn to be covered by a return of flooding conditions. This activity went on for a period of at least thirty-five millions of years,¹ forming bed after bed of peat separated by layers of mineral sediments. These peat deposits slowly changed to coal of high rank, first through oxidation and bacterial action, next through chemical action induced by the pressure of overlying sediments, and last through the mechanical and thermal effects of rock folding. The swamp which yielded the thinnest bed of coal could not have been much less than one hundred and fifty years old; the swamp which yielded the thickest bed could not have been formed in less than fifty thousand years.²

Considering the great variations in thickness of beds, it is reasonable to assume that the age of these swamps before burial differed greatly. When we note differences in thickness and kinds of rocks separating one coal bed from another we realize, also,

¹W. T. Thom, Jr.: "Petroleum and Coal, the Keys to the Future"; Princeton University Press, 1929, pp. 42.

²David White and Reinhardt Thiessen: "Origin of Coal"; U. S. Bureau of Mines Bulletin 38, 1914, pp. 85-95.

that the time intervals between swamps varied from a few hundred to thousands of years.

Considering, then, the great differences in age of these swamps and the great differences in time between the death of one swamp and the birth of the next one, we should expect some changes in the species and perhaps genera of plants from swamp to swamp. In fact these differences have actually been found by Dr. David White, who used the variation

of plant types, indicated by impressions in the roof rocks, as a basis for the successful correlation of the Pottsville coal beds.³

Would these differences in contributory plant types yield coal beds possessing different constitutions? Yes. Would these constitutional variations be so pronounced that they could be

³David White: "Succession of the Fossil Floras of the Pottsville Formation in the Southern Anthracite Coal Field of Pennsylvania"; 20th Annual Report of U. S. Geological Survey, 1900; p. 835.

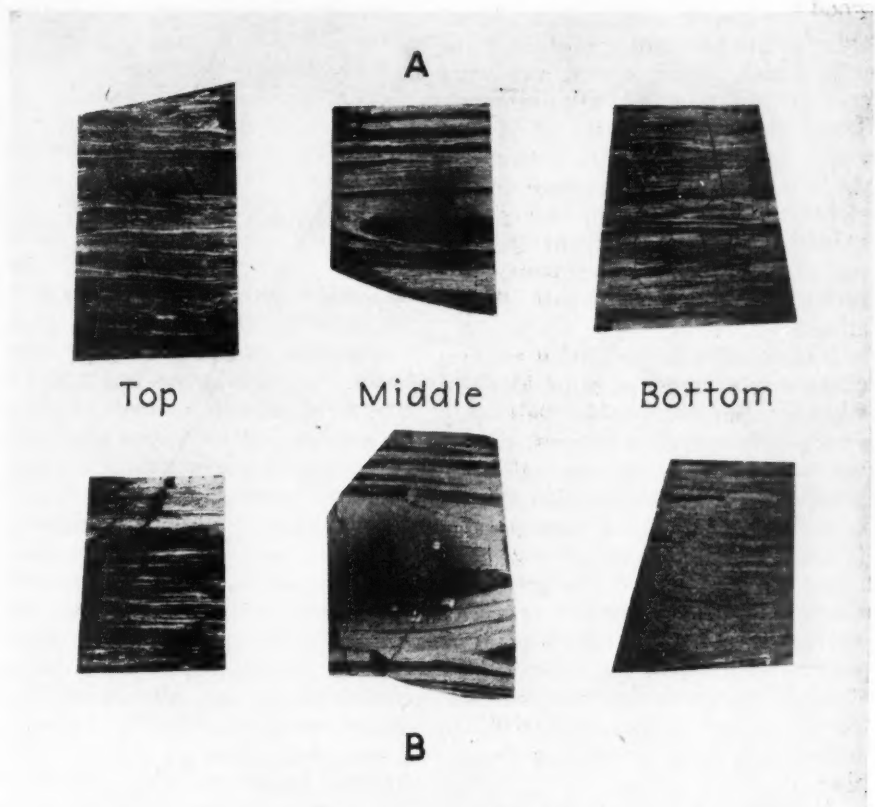


Fig. 1—Etched Anthracite From No. 5 Vein in Mines Seven Miles Apart. Samples A, From Cameron Colliery; Samples B, From Richards Colliery

used as a basis for correlation? Perhaps.

One can readily see that two coal beds of about the same thickness, and separated by no great interval of time, might have been derived from swamps containing about the same types of plants. In fact, if the coal constitution depended entirely on plant differences the problem would be much more difficult than it is. The other factor which influences the constitution of the coal is the degree of alteration of the swamp plants under various conditions of water cover and biochemical action.

A study of existing swamps or bogs shows us that the accumulated vegetation ranges from slightly decomposed plants to matter which has been altered to amorphous residues retaining only traces of former plant life. In the latter case the original wood has almost wholly decayed and only such resistant substances as resin grains, pollen, spores, and waxy coatings of leaves, etc., are preserved. These variations in state of preservation are due in part to changes in the kinds of plants growing in the swamps, but largely to changes in conditions, such as rate of growth, water level, land movements, and probably seasonal or climatic fluctuations.

It is conceivable, then, that swamps containing exactly the same kinds of vegetation might yield coals with vastly different constitutions, due to variations in conditions affecting plant decay or preservation. It is conceivable, also, that swamps containing different kinds of vegetation might yield coals with the same constitutions where decay had been carried to the end point in both cases or, on the other hand, the constitutional differences due to different kinds of vegetation might be emphasized by unlike conditions controlling the extent of decay.

It might be well at this point to call attention to the fact that the constitutions of coal resulting from various kinds and conditions of plant materials at the close of the biochemical action in the swamp are never completely effaced by subsequent dynamochemical action. In other words, all ranks of coal with the exception of graphitic anthracite show, under the microscope, almost the same constitution that they possessed at the close of the earlier peat stage of development.

Theoretical considerations, then, lead us to anticipate constitutional differences between the anthracite beds. Whether these constitutions

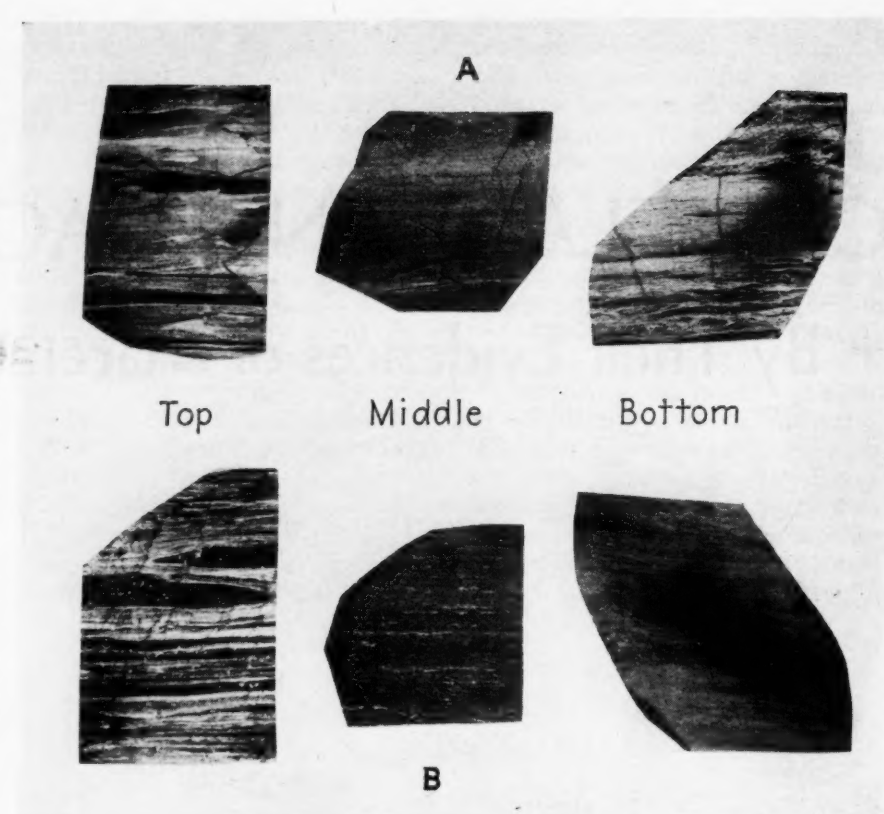


Fig. 2—Etched Anthracite From Mammoth Bed in Mines $1\frac{1}{2}$ Miles Apart. Samples A, From Richards Colliery; Samples B, from Pennsylvania Colliery

are uniform throughout a given bed and whether they are sufficiently different from bed to bed to serve as a basis for correlation are questions that an effort will be made to answer by a recital of the results obtained in the course of experimental work.

Before comparing constitutions of definite beds of coal, it might be well to have a clear idea of what is meant by constitution. Careful inspection of a lump of anthracite will show that it is more or less laminated. Brilliant jet black bands will be seen imbedded in, or alternating with, layers which are slightly duller and consequently not so black. These brilliant bands are called anthraxylon. A microscopic examination shows them to be composed of strips of wood such as tree trunks, stems, twigs, etc. The duller layers are shown under the microscope to be composed of plant materials of many kinds, such as spores, leaf coatings, resin lumps, and very thin strips of wood, together with structureless degradation products and mineral matter. These duller layers are called attritus. In addition to these two main constituents, anthraxylon and attritus, one finds thin layers and chips of charcoal which are commonly called fusain. Fusain is a dull black material and has the appearance of ordinary charcoal both under the

microscope and to the naked eye.

As has been shown under theoretical considerations, the quantity of each of these three main constituents in different coal beds would vary with the plant types from which the original peat was obtained and also with the relative preservation of the ingredients after the biochemical action had ceased and before dynamochemical action had started.

The samples used in this work were collected from collieries in the Western Middle Field and Southern Field of the anthracite region where the identity of the beds in question was not open to doubt. Samples were taken from top to bottom in those portions of the beds which were free from unusual features such as excessive bone, pyrite, or sheared coal. The beds studied were the Mammoth, Primrose, and No. 5. The Mammoth was sampled in the Cameron, Pennsylvania, and Richards collieries over a distance of seven miles. Samples of the Primrose were taken in the Cameron, Richards, and William Penn collieries over a distance of about seventeen miles in the Western Middle Field and at one place, the Lytle colliery, in the Southern Field. No. 5 was sampled in the Cameron and Richards collieries.

These samples were carefully studied under the microscope, using

low and high magnifications. Pieces were cut out of the original lumps by a hacksaw and polished to a scratch-free bright surface on carborundum disks and cloth-covered iron disks coated with a paste of the finest carborundum powder obtainable. The polished face was then etched by means of a blowpipe flame and examined by reflected light, using the regular metallographic microscope with arc-lamp illumination. This study showed the kinds of materials of anthracite and also their distribution and condition of preservation.⁴ As this work progressed, it became evident that the different beds varied in constitution. These differences were seen to best advantage under



Fig. 3—Sample From Mammoth Bed, Cameron Colliery; Chiefly Anthraxylon

low magnification. In fact, it was soon learned that deeply etched specimens could be used to advantage without the aid of the microscope.

Accordingly, another set of samples was cut out of the original lumps. The sawed surfaces, at right angles to the laminations, were reduced to flat faces by grinding on a coarse car-

borundum disk, but no attempt was made to obtain a polished surface. These specimens were etched by placing them face downward on an iron screen of 2-in. mesh and permitting bunsen flames to play on the coal surfaces from below. At the end of an hour or so the surfaces were found to be coated with ash, so distributed as to show the constitutional details very clearly. In every specimen the woody components (anthraxylon) remained black, while the areas of plant debris (attritus) became coated with light colored ash. The charcoal (fusain) burned to a very "fuzzy" ash, distinct from the other substances.

The samples were placed in their original order as soon as they became thoroughly etched. When they were laid out on a table so that one bed could be compared with another, it required but a glance to see that the constitutions were alike for the same beds and unlike for different beds. In every case, the change in detail of the constituents from bed to bed was far more pronounced than lateral changes in the same bed, even when the localities sampled were many miles apart. Of course, as the number of beds examined increases, less contrast will be noticed from bed to bed. The employment of a statistical method with careful measurements of components should, however, overcome this difficulty.

In the accompanying photographs, the dark bands represent anthraxylon (wood); the lighter colored finely laminated material represents attritus (plant debris); the fusain (charcoal) does not show in the photographs, although it is distinctly seen in the specimen itself.

Fig. 1 shows representative samples from top to bottom of the No. 5 Vein from two mines (Cameron and Richards collieries) seven miles apart.

The top samples in both cases are composed chiefly of anthraxylon; the middle samples are about half anthraxylon and half attritus; the bottom samples are attritus.

Fig. 2 depicts samples from top to bottom of the Mammoth bed from two mines (Richards and Pennsylvania collieries) 1½ miles apart. The top samples show anthraxylon in a background of attritus; the middle samples are almost free from laminations, suggesting thorough plant maceration. The dark color further suggests that anthraxylon was the chief constituent. The bottom samples are largely attritus.

Fig. 3 is a sample of the Mammoth bed from the Cameron colliery, showing chiefly anthraxylon.

Fig. 4 is a sample of the Primrose bed from the William Penn colliery, showing chiefly attritus. This constitution is the same from top to bottom of the bed.

Fig. 5 is representative of the constitution from top to bottom of the Primrose bed from the Cameron colliery. Attritus is the chief constituent.

The morphological constitution of Pennsylvania anthracite seems a promising basis for correlation. In the identification of the beds thus far examined it has given accurate results. Whether it will be equally effective for all the beds of the region cannot be stated until all have been examined. It should yield highly accurate results in a given colliery, fairly accurate results in a given coal basin, and at least significant results from basin to basin. Its simplicity and ease of application make it sufficiently valuable to warrant further inquiry. It is anticipated also that many of the physical and chemical properties of anthracite will be found to be closely related to the coal constitution.

⁴H. G. Turner: "Constitution and Nature of Pennsylvania Anthracite With Comparisons to Bituminous Coal"; *Transactions, American Institute of Mining and Metallurgical Engineers*, February, 1930.

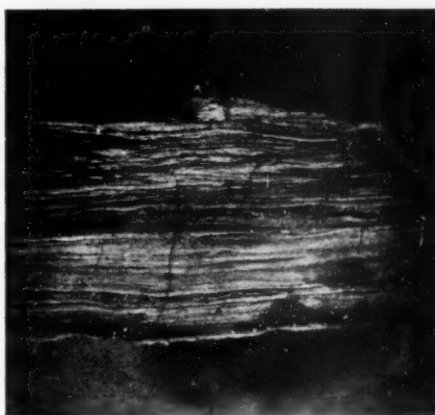


Fig. 4 — Sample From Primrose Bed, William Penn Colliery; Chiefly Attritus

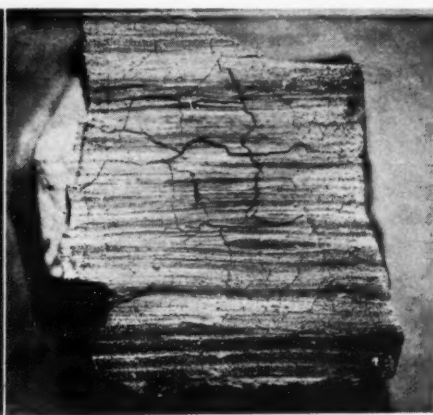


Fig. 5 — Sample From Primrose Bed, Cameron Colliery; Chiefly Attritus

BETTER AND BIGGER CARS

+ Needed in
Modern Mines

By GEORGE A. RICHARDSON

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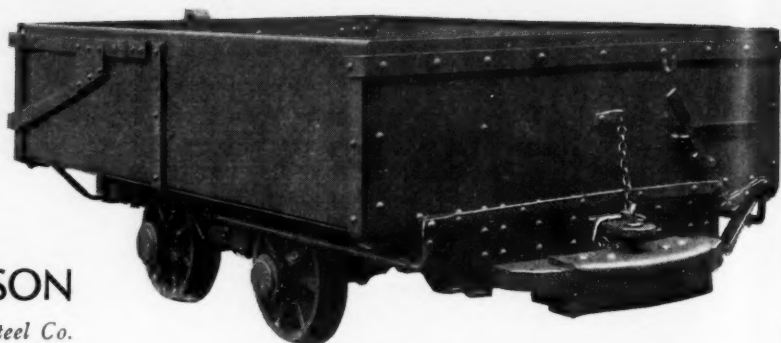


Fig. 1—Lifting Endgate Car

AS a result of radical changes in coal-mining methods, old standards in mine-car design are rapidly, and for obvious reasons, becoming obsolete. Economic conditions that have been developing for some time have forced mine owners to concentrate their mining methods, getting a large production from the development of a small area. This in turn has intensified the problems of transportation, for to perform the work efficiently and economically, the movement of coal from the working face must be rapid.

It has been said, and rightly, that good track is of fundamental importance in modern mining operations. Higher operating speeds, less delay from derailments, longer trips with the same motive power as a result of decreased tractive effort required; these and other advantages are all obtainable to a large extent by using track that is heavy enough for the service and maintaining it properly.

But if well-maintained heavy-duty track is imperative, it is equally important that the proper type of car be used. Ease and rapidity of loading, hauling capacity per given unit of motive power, elimination of derailments and speed of movement are all affected by design. Modern requirements call for cars of large capacity and of such sturdiness that need for repairs will not put them, even temporarily, out of service.

In the adoption of cars of improved design half-hearted action will not give results. The question to be considered is: Whether the greater economies incident to the simul-

taneous scrapping of all the old equipment will not greatly outrun the advantages of a gradual substitution. This holds particularly true where wooden cars are to be replaced by either composite or all-steel cars. There are several reasons for this. In the first place, in mixed service the wooden cars will be wrecked by the heavier equipment, a fact which the steam railroads early learned in both freight and passenger service. More important, however, is the fact that if, in order to obtain increased capacity in the new cars, advantage is to be taken of every available inch, it is necessary in many cases to lower the bumpers and make other changes fully as vital.

Unless the operator is willing to spend additional money for changing his dumping or caging equipment also, it will not be possible to design a car that will give the maximum capacity. Hence, a large part of the saving which the operator had expected to realize in this new installation will be lost. If a better car than the one in use can be obtained, all the old equipment should be scrapped and replaced by the new equipment of this more desirable type, thus adding to the operating economies the advantages of standardized maintenance.

Such ruthless scrapping and standardization in replacement will be a source of profit and in no way a loss. Conservative figuring shows a marked reduction in operating costs. At least 5c. a ton can be saved by the intro-

duction of modern transportation equipment. Some large operators declare they have saved 15c. to 25c. a ton as a result of modernization of this type, thus making the new cars pay for themselves in the first year. Where mining areas have been concentrated and the proper cars put in, production in some large mines has been doubled.

Three types of car are in general use today:

1. *Wood Car*—For a long time this type of car dominated the situation because of its low first cost, its ease of repair by unskilled labor, and its flexibility of body. Improvements in manufacturing methods, large-scale production, and other factors have destroyed these advantages, and today wood cars are rapidly being displaced at most of the larger mines.

2. *Composite Car*—This is the term applied to any car built of steel and wood. As a matter of fact, however, for most practical purposes it has come to mean one in which steel is used in all parts except the bottom, which is of wood. This type of car probably is the most popular of any, because of its great resiliency. To give that quality to an all-steel car, some type of draft gear usually is employed. This increases the first cost.

3. *All-Steel Car*—This type is no longer an experiment and is coming into general use in a number of large operations, because of its many ad-

vantages, which will be described in detail later.

Within each of the groups mentioned there are, of course, numerous variations in design which are determined to a large extent by local conditions. These determinants include such things as the height and quality of the coal seam, physical characteristics of top and bottom, haulage conditions, type of dumping equipment at tipple, etc. Some of these are fixed and others subject to modification if conditions warrant.

Added to these purely local requirements are considerations as to the advantages of using stock material and sizes as far as possible so that repairs can be made with a minimum expenditure of time, effort, and expense. Bearing all these considerations in mind, the problem is to design cars that have maximum capacity, convenience in loading and dumping, ability to stay on the track, minimum friction, and low maintenance cost.

Some years ago the swinging door was a standard type of construction, though it has a number of disadvantages. In particular, it makes it necessary to allow clearance around the gate. Through this space much coal is spilled along the main haulage-ways, resulting in costly track cleaning and rock-dust renewals. Furthermore, with this type of endgate the headroom must be 6 in. or more greater than with some of the designs now in use. If this allowance is not made the gate will not be high enough to leave room for the coal to slide out. Furthermore, with a "rocker end," as it is sometimes called, the door bumps the coal and is broken as it slides through.

Drop ends in the rear of the car, so long customary in car design, do not share in the condemnation meted out to the swinging door. They are still standard, and with good reason, wherever high cars are loaded by hand. In the case of the car shown in Fig. 2, the coal is loaded with the end plate dropped down for as long a period as is convenient. Then the plate is raised and the loading completed. This feature greatly reduces the labor of loading.

THE first step in the progress of car design has been replacement of the swinging door by the lifting endgate. A leading operating company in the West Virginia field was using cars of the composite type equipped with a swinging gate and having an over-all height of 3 ft. 7 in. from the top of the rail. It was de-

cided to replace these with new ones of the lifting endgate type designed for the same service. Despite the fact that the capacity of the new cars was the same as that of the old (4.4 tons) the over-all height was only 3 ft., a saving of 7 in. After the new equipment had been in use for six months it was found that the miners were averaging two tons more per man per day.

Aside from the gain obtained by a reduction in height the car with the lifting endgate eliminates some of the disadvantages of the swinging endgate type. The door fits snugly, resulting in reduced track-cleaning and rock-dusting costs. The expense of maintenance is lowered because the lift-end car is more rugged than the swinging-gate car can possibly be. Fig. 1 shows the trim air of the new car and its general appearance of compactness and solidity.

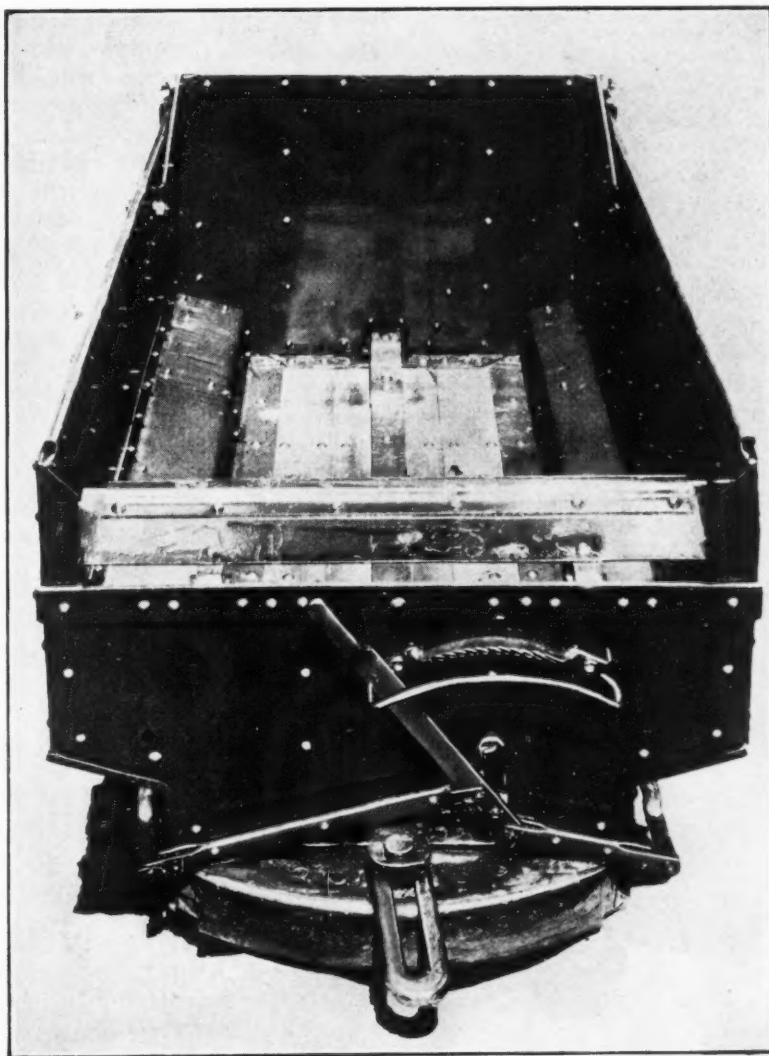
In speaking of the lifting endgate type it is to be understood that this is the type in which the pivot is located at some distance short of the

end of the car. At the dumping point the gate is hooked up by some sort of catch mechanism and held in place while the end of the car is allowed to drop down to the dumping position. This car represents one of the first steps in transition from a high, unwieldy type to a low one.

The adoption of the tight-end composite car marks the second important step in design. The improvement over the lifting-endgate type is as great as was made in replacing the swinging end by the lift end. By making use of a tight end, a car can now be built which weighs 150 lb. less than before with the same dead-load capacity. To use such a car a rotary dump must be installed if this has not been done already. Practically all the newer installations embody rotary dumps. Not only can the weight of the car be reduced but a much stronger car can be built and one that will cost less for maintenance, labor, and repairs.

A large percentage of endgate mine cars are designed around this gate.

Fig. 2—Drop End With End Plate



If a car is the least bit out of true the gate will not close. This applies particularly to those with rocker endgates but also occasionally to the lifting endgate type. Tight cars do not have this disadvantage and the riveted end binds the sides of the car together.

Fig. 4 shows a low-side composite car of the bench type without hoods, as built for a low seam. Four corner clips are provided to furnish a bearing for "caging" in a rotary dump. The brake is set inside the car with a pocket to keep it free from the coal.

Figs. 5 and 6 show a high-side composite car of the hooded type for a rotary dump. The car is caged in the dump by use of angles along the sides. This car has a drop end which makes it as easy to load as if the sides were 10 in. lower. It will be noticed that this is a gusseted car without body bands (vertical bands outside of the car), the elimination of these being a distinct advantage. Additional capacity is thereby gained wherever clearances are absolutely fixed, as in the case of cars that have to be hoisted up a shaft. Not only this but the use of light diaphragms inside the car makes it much lighter in weight and from four to five times as strong. The use of such gussets is limited, of course, to cars that are handled in a rotary dump.

THOUGH the composite type of car is unquestionably the most popular today, there are reasons to believe that this popularity will diminish, for the most practical of considerations. The main difficulty lies in the fact that it is getting more and more difficult to obtain suitable lumber for car bottoms. A company which builds mine cars on a large scale finds that its rejections on lumber run 15 to 20 per cent on what is supposed to be first-quality mill-inspected-before-loading material.

The life of a mine-car bottom is approximately half that of the sides,

ends, and trucks. A large operating organization in the bituminous field figures that it gets from three to four years from bottoms before it becomes necessary to make repairs and replacements.

One large company in its mine-car construction department is now using a real creosote treatment. The assembled floors are sent out to a creosoting plant where the treating is done by the vacuum process. It is an open question, however, as to whether the use of creosoted floorboards will solve the trouble. Some say that replacement of untreated floorboards is necessitated by dry rot rather than by mechanical wear, while others think that mechanical wear is the most important cause of deterioration.

THE all-steel car marks the latest development in the transition of design and is likely to be generally adopted before many years have elapsed. Even now a number of companies favor and use this type of car.

Many factors combine to make it the logical outcome of experience in operation. Mass-production methods have lowered manufacturing cost so that one of the advantages of other types is being done away with. Not only this, but the same methods make it possible to obtain replacement parts expeditiously and economically, so that in many cases replacements cost less than repairs. Modern improvements in the making of pressed-steel parts make it possible to design mine cars to much better advantage. In their efforts to produce lighter cars per unit of capacity with greater overhead clearance, manufacturers have approached their ideals today far more closely than they found possible years ago, and to these features they have added greater strength.

At the present time the ultimate trend appears to be toward the all-steel car equipped with some type of draft gear which embraces a coupling feature. The use of all-steel makes de-

sirable some special form of bumper or draft gear which increases the initial cost of the car. However, in some cases this need is met by inserting in the frame enough wood at one end to serve the same purpose. This makes it possible to dispense temporarily with draft gear, for even without it some resiliency is obtained.

Three examples of all-steel cars may be described. Each possesses certain characteristic features already detailed, variations being due partly to local conditions.

The first car, shown in Fig. 6, was designed for use in a thick coal seam. The car is of the lifting endgate type which has to be used where rotary dumps are not provided or where room is lacking to permit of a rotary dump being installed to advantage. It has what is known as a vestibule end, i.e., an end which by tapering out increases capacity and at the same time removes the corners which in square-ended cars reduce on curves the clearance between one car and the next. A coupler and draft gear form part of the assembly. The coupling is of malleable iron.

Fig. 3 shows a car that is well adapted to the use of the average mine where the coal is of medium thickness. It is of the hooded type and when run on a rotary dump, is caged on four round-corner clips. Note in the illustration the tops of the gussets or diaphragms which have been placed inside the body to replace the outside body bands. In order that, even without the use of draft gear, resiliency may be obtained, the bumper is

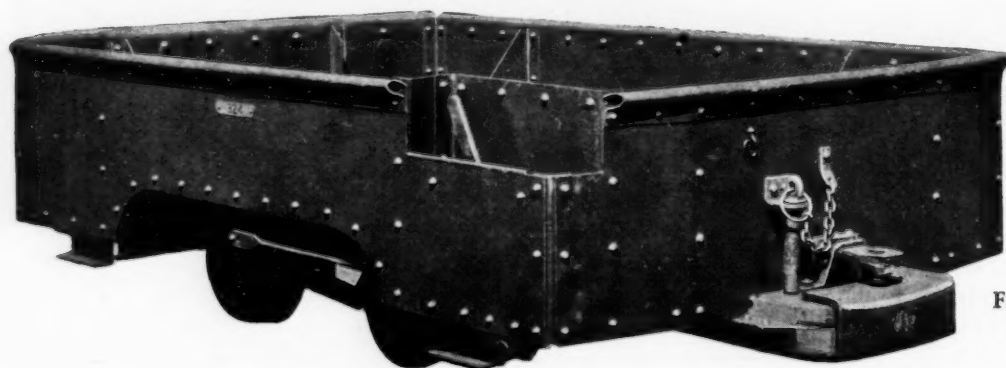


Fig. 3—All-Steel Car; Bumper Backed by Wood Block in Place of Draft Gear

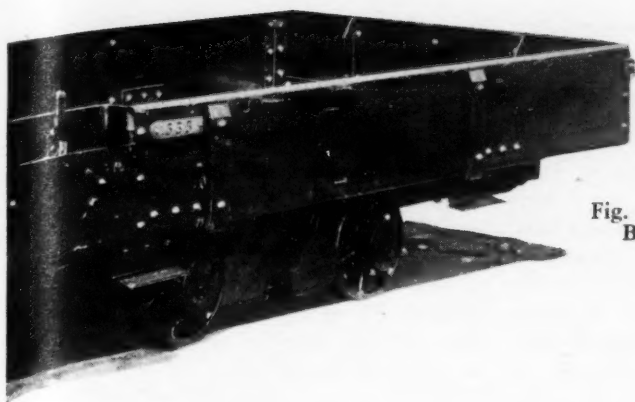


Fig. 4—Low-Side Composite Car, Bench Type; Bench Is Indicated by Front Plate

backed up with a wood block. The use of tight ends accords with good practice. A box surrounds the brake.

An interesting departure in design is to be seen in the car featured in Fig. 7, which has been planned to meet local conditions. In southern West Virginia and also in part of Kentucky, a thin seam 30 to 36 in. thick and of more than usual quality is being mined. The car was designed for use in this particular seam, where, because of the high grade of coal, which commands a much higher price than ordinary steaming coal, money was available to buy a type of car that would give more than usually economical service.

This car is unusual in many ways. With the ordinary type of car the mine operators got practically no capacity. One of the particular fea-

tures in the design of this special car is that every available inch over wheels and trucks has been used. The hood sheets over the wheels are made by pressing out the bottom.

The top of the car is only 23 in. from the top of the rail. Despite this low construction the car has the surprising water-level capacity of 74 cu.ft. The large cars mentioned in the first part of this article are 3 ft. high, about a foot higher than the car being described. They have a capacity of 117 cu.ft. If that same 13 in. were to be added to the height of the car under consideration, it



Fig. 5—Car With Gusseted Sides, Suited Only for Use With Rotary Dump

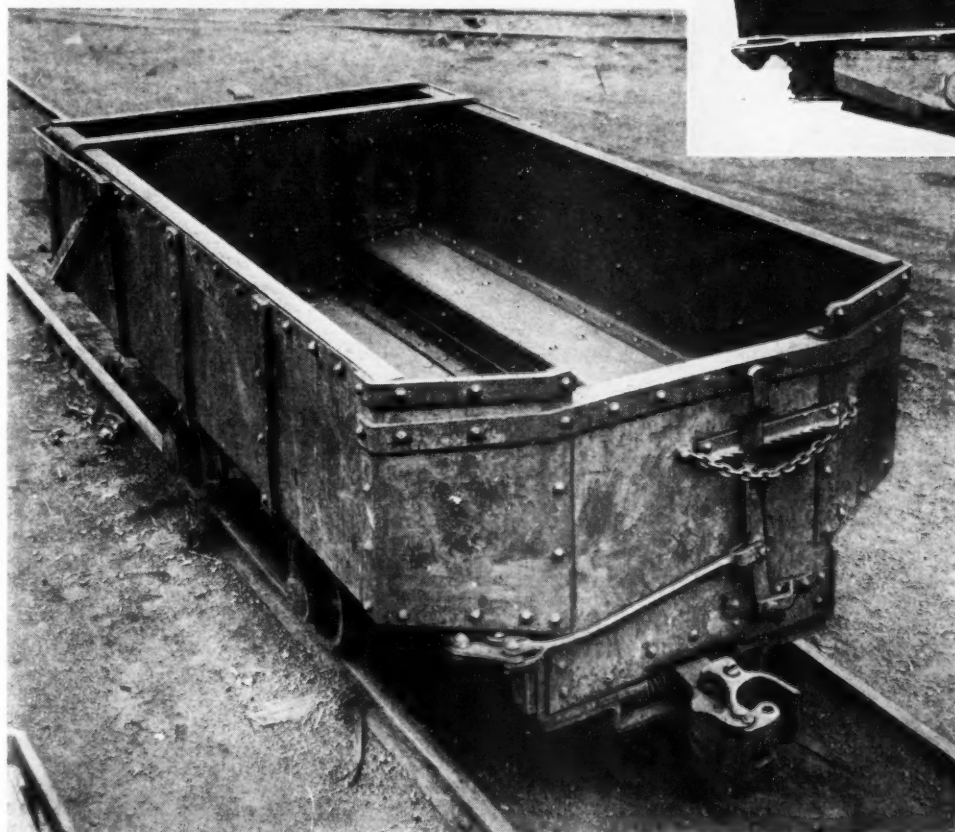


Fig. 6—Car With Vestibuled Rear, Bench Floor, and Lifting Endgate

would have a capacity of 134 instead of only 117 cu.ft. The construction is all-steel, that being made necessary by the character of the design.

There is still another unusual feature in regard to this car. It is safe to say that of all the roller bearings in use today fully 95 per cent are mounted in the hub of the wheels. In the present instance, due to the design and extreme width, the bearings are put in outside self-aligning journal boxes.

Special attention in designing is being given to increasing the ratio of live load to total dead weight. Until quite recently about one pound of coal was hauled per pound of car, a poor showing as compared to steam-railway performance, where a 50,000-lb. car carries about 100,000 lb. In the coal mines the usual car capacity is 50 to 100 cu.ft.. The aim has been to raise the ratio of live load to total weight of loaded car to 60 per cent or 66 per cent, which would then compare with broad-gage practice. For example, this ratio would be obtained in the case of a car weighing 3,950 lb. when capable of carrying a load of coal of 8,000 lb. Here the total combined weight is 11,950 lb., of which the weight of the coal is about 66 per cent, i.e., 2 lb. of coal can be carried for every pound of car.

A betterment which is greatly needed, and which it seems reasonable to expect in the near future, lies in the type of wheels used on cars. At the present time all mine cars with the exception of but a small percentage are furnished with cast-iron wheels. In some cases where the service was severe and heavy loads had to be carried, cast-steel wheels were supplied, but neither cast iron nor

cast steel fully meets present-day needs.

On old main haulageways 8 to 15 miles per hour used to be considered a good speed and the loads in general ran only from 1,500 lb. to 1½ tons. Today, loads of from 4 to 5 tons are common practice, and speeds have been greatly increased. These two conditions in themselves call for the development of a better type of mine-car wheel. A factor requiring consideration is that certain types of bearings still being used have little play. As a result irregularities of the track and other track defects cause a side thrust which is taken up by the bearings and in turn transmitted to the wheels.

BROKEN flanges and wheels are a frequent cause of derailments, which can be overcome to a large extent by improved design and the use of material adapted to heavy duty. It is just 21 years ago that the steam railroads first began to experiment with and use solid wrought-steel wheels. In the period that has elapsed the older types of cast and built-up wheels have been displaced entirely in passenger service and to a large extent in freight service, particularly where severe duty is encountered. Wrought-steel wheels have all the advantages of worked and forged steel and are free from the defects which are found from time to time in castings. They are as well suited to mine as to steam-railway service.

The use of special bearings has developed with remarkable speed and

the plain-bearing wheel has practically gone out of use. Out of about 12,000 cars built by one company in the last 3½ or 4 years only 300 were provided with plain bearings.

The time has come to reduce axle sizes by the use of better grades of steel and of heat-treated material. In fact, already the general tendency is in this direction. Not only will axle weights be reduced as a result but also bearing weights, because of the smaller bearing areas.

It is not the intention to convey by this statement the impression that it is wise to reduce all axle diameters. Rather, it is the purpose to point out that cars of increased capacity call for axle diameters in ordinary steel that are larger than desirable or necessary. There is a feeling that a diameter of about 3¼ in. should not be exceeded, and this has been made possible in the newer cars by using a heat-treated steel of great strength.

Mine transportation methods are passing through the same cycle of development as have steam railroads. In the early days they also had their small wood cars and their comparatively light rails, etc. Gradually the size and capacity of the cars increased and heavier track material was used. Wood cars gave way to composite cars and finally these in turn were displaced by cars built entirely of steel. The demand still continues for even larger cars and higher operating speeds. One of the largest railroad systems in the country is not only increasing the size of its cars but relaying its tracks so that freight trains can be hauled at what a few years ago would have been considered the unheard-of speed—for freight service—of 70 miles per hour.

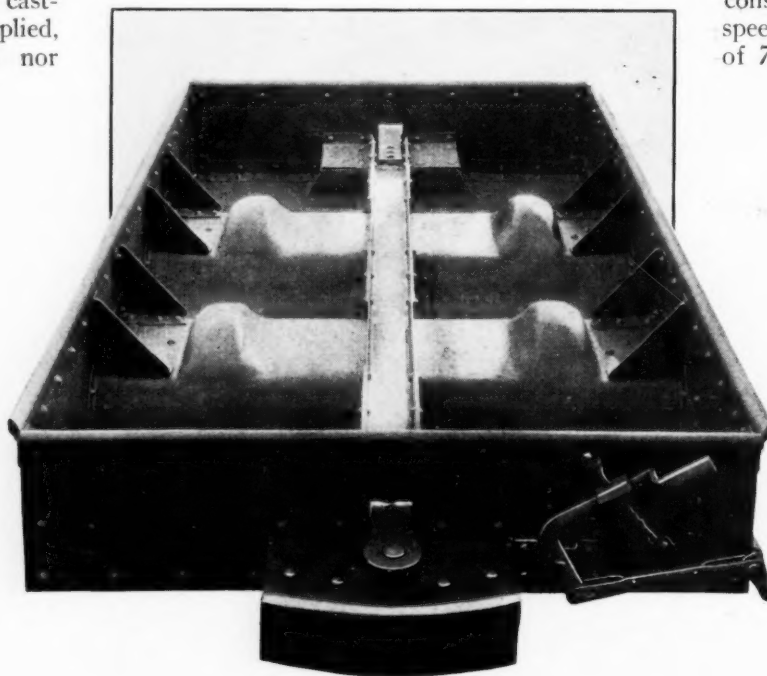


Fig. 7—Low Car, With Hoods in Place of Benches and Gussets Instead of Body Bands

DOMESTIC STOKER

+ To Front as Merchandising Aid

CONCERTED effort on the part of the coal and heating equipment industries through the agency of the Committee of Ten—Coal and Heating Equipment Industries will enable all interested parties to make the most of the available opportunities, was the consensus of opinion at the Oct. 16 session of the annual meeting of the National Coal Association, Detroit, Mich. At this same session, the place of the stoker in the present-day merchandising field was considered as a means of combating the inroads of substitute fuels in the domestic field.

Public demand for the elimination of smoke and the easier control and more efficient operation of the plants and fuels they were using led to the formation of the Committee of Ten, E. B. Langenberg, president, Langenberg Mfg. Co., St. Louis, Mo., asserted. One outgrowth of this organization is a program of local meetings in which representatives of both industries will be given an opportunity to exchange views and become acquainted with each other's problems. Following this movement to its natural conclusion, both groups will then be in position to supply the customer with complete data on the proper handling of the equipment and fuel to be used, thus eliminating "buckpassing" and insuring retention of the customer's good will. Smoke abatement, said Mr. Langenberg, is a major problem and one which can be met only with apparatus that will burn coal smokelessly.

"The advent of the small automatic stoker" is "the most important event" in the coal business in the past ten years, declared E. L. Beckwith, Chicago, president, Midwest Stoker Association. The change, while comparatively sudden, will be enduring, for it is based on sound engineering practice. As is the case with the central stations, relatively and in proportion to cost the same savings are made and the same benefits are enjoyed by the user. The Midwest Stoker Association was formed, Mr. Beckwith said, to help the customer by setting up definite standards of engineering to guide in the installation of equipment. Member manufacturers are taking advantage of every modern form of automatic control,

bearing in mind that convenience is the keynote of today. It is now possible to install stokers fully as automatic as an oil burner, safer to operate, and with a fuel economy of 20 per cent over hand-firing and nearly 50 per cent over oil-firing.

Small coal-burner men make a mistake in inferring to their customers that the cheapest coal will serve, asserted R. C. Goddard, Goshen, Ind., president, Combustioneer, Inc. The dealer is entitled to as good a margin on his stoker fuel as on any other kind. The introduction of the small stoker, he continued, brings up the problem of creating thousands of engineering merchants, and the equipment manufacturers appreciate that they must engineer and build plants so that they can be installed by men who are not technical graduates. Classification of coal "so that irrespective of the section of the country, coal can be sold and purchased with a knowledge that when burned under certain operating conditions it will produce results in accordance with predetermined facts" is the great problem in merchandising domestic coal today. The producer then will know how to grade his coal, the dealer will know just how his product will perform, and the stoker manufacturer can design his equipment to burn cheap coal in any part of the country.

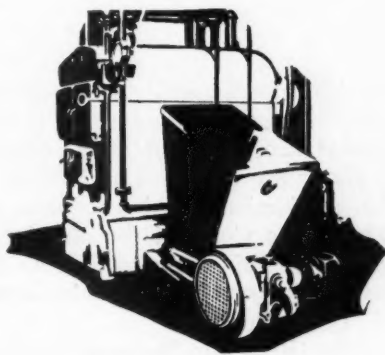
So far, "the accomplishments of the Committee of Ten are in prospect, rather than retrospect," said Milton E. Robinson, Jr., Chicago, president, National Retail Coal Merchants' Association, in discussing the "Co-operation of the Retail Merchant," though this condition does not make it impossible to evaluate its possibilities, pro-

vided all the organizations co-operate. In enlisting the co-operation of the retail dealers, however, no organization should be set up which will be an added drain on their pocketbooks, and the process of enlisting their sympathy should be so conducted that any suspicion of talking down will be eliminated.

"One of the things the activities of the Committee of Ten can do most to accomplish," continued Mr. Robinson, "is the eradication of buckpassing in dealing with the domestic consumer." Up to the creation of the Committee, the coal dealer and the heating man each had his own method of keeping the consumer satisfied. The heating man's method was to put in a side line of oil burners, and the coal man's method was to put in a service department to keep his customers' heating plants in condition. It seems reasonable today that retailers can be sold on the program of the Committee of Ten by persuading them that the heating-appliance dealers do not expect to use their service departments as leads to oil-burner sales. On the other hand, the heating appliance dealers can be sold on the program by persuading them that it means a reduction in the number of coal men who seem to find it necessary to do furnace work.

The large consumption of bituminous coal by industry has nevertheless left for domestic consumption a considerable tonnage of lump sizes, said Walter Barnum, New York City, president, Pacific Coast Co. These sizes were primarily adapted to domestic use by their form value—the fact that lumps are required to produce the voids necessary for air in light-draft, domestic heating plants—and the higher prices they commanded compensated for the lower realization on steam sizes.

Until the development of the oil burner, fuel oil had no form value for domestic use, though now it, as well as gas, can be burned automatically. "The big truth the coal industry must face today is that its superior domestic products have been robbed of their special form value advantage" through developments in the use of fuel oil and gas. The answer to this disturbing condition is the automatic domestic stoker, which will give all the conveniences of oil and gas, as well as the added advantages of safety and economy. With the advent of the stoker, the dealer will not sell coal but service, and his margins on stoker sizes will be as ample as those on lump sizes in the past.



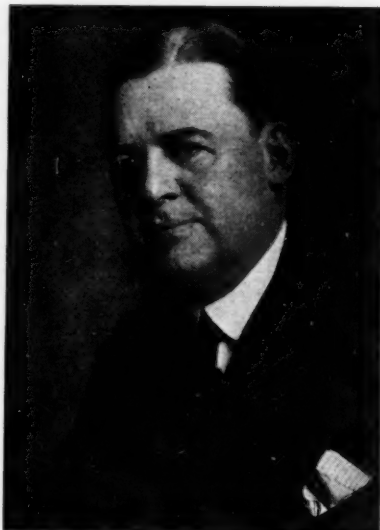
RAILROAD STAKE IN COAL

+ Emphasized at Bituminous Convention

THE STAKE of the railroads in the future of bituminous coal production in the United States was emphasized at the session on relations between the carriers and the coal operators at the thirteenth annual meeting of the National Coal Association, in Detroit, Mich., Oct. 17. The railroad industry, as Conrad E. Spens, Chicago, executive vice-president, Chicago, Burlington & Quincy R.R., pointed out, consumes about 28 per cent of the bituminous production of the country, and the bituminous industry consumes about the same amount of the railroads' commodity—transportation. Consequently, the interdependence of the two industries makes co-operation a necessity.

Fuel oil and natural gas, especially the latter, are competitive factors which are rapidly gaining in force, said Mr. Spens. "While in central western territory its introduction is comparatively new, it has already progressed sufficiently to cause alarm. The coal tonnage on the Burlington lines, particularly west of the Missouri River, has already suffered a serious loss on this account. To meet this situation, it seems obvious that the cost of coal to the consumer, domestic or industrial, shall not exceed the cost of competitive fuels, and that there must be mechanical appliances in connection with the burning of coal that will yield as great conveniences to the consumer as the conveniences offered with other fuels.

"In the matter of cost of transportation, the rates now in effect, and which play so important a part in the cost of fuel, have been made, to a very large extent, by governmental bodies and are, therefore, assumed to be reasonable. But it is not entirely within the realm of fiction for a railroad representative to suggest that to meet natural gas competition it may be necessary to consider only to affected destinations even a lower basis than that established by commissions. It would be better to earn some profit on this particular traffic than to have no traffic at all, and whatever might be earned over and above the out-of-pocket cost would serve to reduce the cost which other traffic would otherwise have to bear. This method of co-operation might appeal to us if the Interstate Commerce Commission



Conrad E. Spens

were to permit the railroads to meet such situations without affecting the adjustment in intermediate territories or at cities where such competition does not obtain."

Decadent passenger traffic and the rapid growth of other forms of transportation have already had a serious effect on the tonnage and gross revenue of the railroads. Conditions are expected to get worse, especially when gas and gasoline lines now building are extended and completed. As the need for transportation decreases, the demand for railroad coal also will decrease. The interests of the railroads and the coal producers therefore are mutual "in that the railroads should be permitted to retain for their haul as great a percentage of the going traffic as possible."

There seems to be little possibility of diminution in the competition of other sources of energy in the aggregate, yet it seems to be a "fair presumption" that, in the course of time, production of substitutes will naturally ebb and that coal will be restored again to the dominant position it once occupied. "In the meantime," Mr. Spens declared, "it may become necessary for your industry to give more serious consideration to the production of byproducts, although this phase of the question is entirely within your province, and outside suggestions presumably would be of doubtful value."

"The Relations Between the Coal Producers and the Railroad Com-

panies as Affected by the International Railway Fuel Association" were discussed by T. Duff Smith, Cleveland, Ohio, lake forwarding agent, Canadian National Railways. Mr. Smith reviewed the efforts of the association to promote economical fueling of locomotives, and remarked that the decrease in the quantity of fuel used per 1,000 gross ton miles has been beneficial to the producer because it has necessitated better preparation. Improved cleaning equipment has enabled the operator to put a better coal in his domestic and industrial markets, thus retarding the introduction of substitutes.

The work of the contact committee of the National Coal Association, formed to meet with a similar group of the American Railway Association, was reviewed by J. D. Francis, Huntington, W. Va., vice-president, Island Creek Coal Co., whose paper, "Contact With Railways Executives," was read by F. W. Wilshire, New York City, vice-president in charge of sales for the Island Creek company. Mr. Francis discussed the activities of the committee on the questions of car allotment and distribution, relating largely to holding loaded cars on the mine siding, and purchases of railroad fuel directly from the coal operators. Since the adoption of an agreement covering the latter by Eastern, Southern, and Middle Western carriers, "not a few" operators, said Mr. Francis, have "utterly failed" to observe the spirit of the agreement. "The railroads have evidenced desire to play ball on a fair basis; they have gone so far as to offer to help us put our house in order; surely we cannot expect them to do the entire job."

Correcting an Error

Through error, it was stated in the October issue of *Coal Age* (p. 587) that the Jeffrey 40-ton tandem haulage locomotives in use at Mines 63 and 120 of the Consolidation Coal Co. were equipped solely with Timken bearings. This is incorrect. The four units in the two Consolidation mines, each consisting of two 20-ton locomotives, are equipped as follows: armature shafts, SKF ball and roller bearings; axles, Timken roller bearings; journals, Hyatt roller bearings.

DOUBLE-TRACKED ROOMS

★ Speed Up Pit-Car Loading

By ALEXANDER BENNETT

Panama, Ill.

WITH the introduction of portable conveyors or pit-car loaders, little or no effort has been made to change the system of room work that has been in general use for generations. The machine, it is true, has increased production by speeding up the loading operation. But it is fair to ask if the result justifies the expense involved. Surely a part of the time lost in moving the machines from place to place and in changing cars can be saved and devoted to more fertile operating phases. The comparative short life of a room should focus the attention of those in charge on a more concentrated effort to gain a larger percentage of coal from a given area in the shortest possible time. There is good reason to believe that this can be accomplished without undue hazard and expense.

Room work in the central Illinois field has become fairly standardized and the panel system, with rooms varying from 24 ft. to 30 ft. in width, according to the nature of roof and bottom, has become the accepted plan. Up to a few years ago, the plan was eminently satisfactory, but now the greater investment made in machines demands the utmost in efficiency. Any mode that cuts the ultimate cost consequently commands instant favor.

After months of experimentation one company adopted the following plan, which, to date, has proved a substantial improvement over the old system. Rooms are turned at 60-ft. intervals and are widened immediately to 40 ft., using double track, as illustrated on the accompanying sketch. At a distance of 50 ft. from entry sights the frog of a Y-switch is laid and double track is continued from there to the face. At a distance of 100 ft. from the heel of the Y-switch, the frog of a cross-over

switch is laid connecting the two tracks for convenient transfer of cars from one track to another, as the room advances.

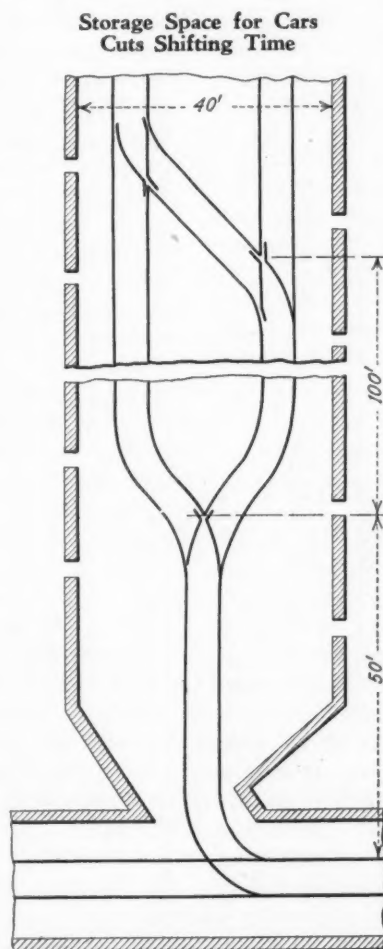
This leaves a 20-ft. pillar of coal between the rooms. In driving cross-cuts, the coal can be loaded out without the necessity of switch or track, only two cuts from each side being necessary to connect rooms. Furthermore, it will be found that a seam of coal 8 ft. high at a face, 40 ft. wide, cut 6 ft. deep, will

yield enough coal to keep a crew of four men on a portable conveyor busy for 8 hours. Thus is eliminated the lost time in moving the machine from one room to another. By concentrating five 4-man conveyor crews on a 15-room entry, a high percentage of coal can be recovered. Timbers and track can be put in the clear.

In this system rooms can be completed and caved in 6 months. As mining is swift, squeezes are less likely to occur and bad top becomes less troublesome — two serious troubles encountered in the earlier plan of operation.

By placing of the Y-switch at the distance of 50 ft. from the entry sights storage room is provided for four loaded cars. As the productivity of the average 4-man conveyor crew is between 4 and 5 cars an hour, this gives ample leeway for changing cars. One 5-ton locomotive can handle the coal from all 5 conveyors. A simple calculation will prove the high efficiency herein derived. When the room is advanced past the cross-over switch, the handling of both cars and conveyor is greatly expedited. One of the two tracks behind the cross-over switch becomes a storage track for empties and the other for loaded cars, depending on the side of the room on which the crew is loading.

This plan can be worked just as well in the thinner seams. It is applicable to any seam with conditions which merit consideration for machine loading. Emphasis is laid on the imperative need of substantial roof supports, which can be recovered when the rooms are worked out and used over and over again.



COAL AGE

SYDNEY A. HALE, *Editor*

NEW YORK, NOVEMBER, 1930

Rock-dust veils

THOUGH the value of rock dust has been long recognized, agreement has not been reached as to its exact action in preventing the spread of flame. Perhaps a cloud of rock dust may be compared to an extremely inefficient wire gauze through which flame seeks to penetrate. The veil of dust succeeds in preventing the passage of flame, not because it takes up heat so readily but because its thickness is not to be reckoned in millimeters but in hundreds of feet. In one sense—that of its capacity for heat—rock dust is ideal. The capacity for heat of earthy bodies is about twice that of copper. Unfortunately, copper has 50 times as great a conductivity as rock dust. That is one reason why the rock has to be ground fine in order to have protective effect.

There is a wide range, however, in the power to transmit heat. Marble has 50 per cent greater conductivity than slate and $5\frac{1}{2}$ times the conductivity of sand. Specific heats are more uniform; so uniform in fact that choice between dusts could hardly be based on this quality. The conductivity of limestone is not available. Perhaps limestone does not have any similarity in this respect to marble.

So far, little has been done to test the value of dusts of different materials. The fineness of the dust and its percentage in the mixture have been treated as the most important of all determinants. Nevertheless, it would seem that further inquiries should be made into the relative immunities conferred by different dusts and the reasons for them. Without the inquiry, the research must remain incomplete.

Car turn as efficiency index

DURING THE WORLD WAR much stress was laid on inefficiency in the use of equipment, especially of mine cars, and since then data have been collected at many mines as to the number of turns made per car daily. But, like many other efficiency stunts, this stunt may be overdone, for when there is such great anxiety to keep every car on the move, either to or from the face, cars have to be dumped promptly on arrival at the tippie or the foot of the shaft, thus overloading the picking tables or the other cleaning equipment, as well as the screens, and in

some cases the hoist also. Regularity is an important factor in proper cleaning. Large bins may be introduced, but they cause segregation, they break coal, and they, like mine cars, involve the investment of capital.

In a big mine the coal is not uniform. Some areas produce a friable coal and others coal that is harder. In some the coal is fine, in others coarse. Some areas produce dry coal, others wet. The impurities vary also from one section to another. If, then, choice can be made in dumping, a mixture can be obtained that will meet the needs and capacities of the cleaning plant, keep the picking-table force busy, but not rushed, and will furnish coal to the market that will meet specifications.

Wasted time is inevitable where there is an inadequate supply of cars. At some mines coal is loaded on idle days by miners and day men, and when the tippie works, a large tonnage is obtained and loaded in a few working hours. This arrangement can be made only where plenty of cars are available. Hence, efficiency in turns per car per day may be too dearly bought. In most mines the correct measure of efficiency is the number of cars brought to the tippie per unit of locomotive mileage.

Why our coal should be washed

IN CONTINENTAL Europe, the cleaning of coal has taken a large place because of the quantity of impurities needing removal. Britain has not been so active in that regard, because her coal is cleaner. Perhaps the United States has a similar excuse, but there is one good reason why the United States should regard the cleaning of coal as a necessity. In almost every case on this continent the greater part of the cost of coal is the cost of transport. Coal itself is relatively cheap; freight is high. Consequently the value of the inferior coal at the mine to the purchaser, when freight is figured, becomes less than nothing. He should be paid for accepting it.

A ton of refuse with 30 per cent ash will give, perhaps, if the coal is low volatile, 10,500 B.t.u. per pound; at least, it is true that, when mixed with cleaner coal that would permit of complete combustion, the quantity of heat stated might be obtained from it. A ton of clean coal, of the same character but with 5 per cent ash, would give about 14,250 B.t.u. per pound, or 1.357 times as much heat. Thus one ton of the clean coal would be worth 1.357 tons of the refuse. It would be more profitable to pay \$8.14 for the clean than to pay \$6 for inferior coal, the price of both fuels including delivery. With a freight rate of \$4 and the mine price of the refuse at \$2, the purchaser who was buying the refuse for \$6 could without loss switch to clean coal at a mine price of \$4.14 a ton. But as this latter coal could be obtained at the mine doubtless for only \$2 or \$2.50, the loss sustained in accepting the refuse is from \$1.64 to \$2.14 per ton. All this

takes no account of the coal losses in burning a dirty fuel, the costs of stoking it, the expense of ash removal, the clinkering of the ash, and other factors.

Evidently it does not pay to haul the refuse under such circumstances, and it is never done except as mixed in with the cleaner coal from the mine. Seeing that impurity in the coal is such an obvious economic waste, the coal industry should give up its prepossession that it is true conservation to ship the refuse to market. The public cannot afford to accept it, especially where the freight and delivery costs are more than \$4 and the mine price less than \$2, as often happens.

Will they act?

DECLINE in bituminous coal production because of the inroads of substitute fuels cannot be considered apart from the effect such decline must have upon the railroads both as carriers of freight and as consumers of coal. This duality of interest already has found some concrete recognition in traffic surveys undertaken by certain carriers and by conferences held and impending between coal operators and railroad traffic officials in territories threatened by the lusty renaissance of natural-gas competition. Conrad E. Spens, executive vice-president, Chicago, Burlington & Quincy R.R., gave public expression to what is in most coal men's minds on the subject when he told the recent convention of the National Coal Association that:

In the matter of cost of transportation the rates now in effect and which play so important a part in the cost of coal have been made, to a very large extent, by governmental bodies and are, therefore, assumed to be reasonable; but it is not entirely within the realm of fiction for a railroad representative to suggest that to meet natural-gas competition it may be necessary to consider, only to affected destinations, even a lower basis than that established by commissions. It would be better to earn some profit on this particular traffic than to have no traffic at all, and whatever might be earned over and above the out-of-pocket cost would serve to reduce the cost which other traffic would otherwise have to bear.

With railroads and their spokesmen telling the world that present net returns on traffic as a whole are inadequate, even this carefully qualified opinion of an executive of one of the major transportation systems may be challenged by some of his associates as unorthodox and dangerous. But the practicality of the analysis cannot be gainsaid. In the Southwest, some railroad interests already have moved to combat oil lines with reduced rates. It remains to be seen, however, whether the rail carriers as a group will face the situation which pipe-line transportation is creating or repeat the deadly delays that gave the bus lines and the trucks their opportunity to eat into rail traffic and revenues. To follow such a policy of procrastination in meeting the growing pipe-line competition will invite far more serious losses to both the railroads and the coal industry.

"English as she is wrote"

IN EVERY industry words become used out of their proper meaning. Some are applied so generally that they lose their force. When a glossary is compiled it takes the words as it finds them, perhaps noting in what districts they are used, but in general no effort is made to restrict the use of the words to their primal meaning or to apportion the field of expression among the several words now having overlapping territory. So it is that language fails adequately to express thought.

The electrical industry has striven to rid itself of such ambiguity, and in almost all technical lines some effort in similar directions has been made. Expressions which might have meant something other than **has** been applied to them, or which might have meant other and additional things, have been rigorously confined to a single meaning. Unfortunately, electricity was a new science with only a few words. As a result, synonyms are almost unknown in electrical language, and expression is hampered.

In mining there have been so many separate producing regions with a dialect all their own, especially in Great Britain, that the language of the mines is rather overloaded with synonyms, and indeed will continue to be so even after metes and bounds of use have been set, unless many words be proscribed.

American and British non-technical dictionaries have done little to keep the language free of anomalies. That work is being attempted in France by the French Academy and was early tackled in Italy by the Reale Accademia della Crusca. A similar effort to bring our technical language under definite control is greatly needed. Particularly glaring difficulties are the use of the word "entry" for a heading or a group of headings, the ascription of the word "gob" to the place where rock is stowed on the advance and also to the place where it falls on retreat, and the application of the word "chute" to a "slant" or "shoo-fly." Instances of such anomalies could be multiplied.

Progress

BBETTER PROOF of the changing psychology of the bituminous industry than the Detroit meeting of the National Coal Association hardly could be asked. Adversity is no longer a hobble; it has become a spur pricking leadership to action. Old ideas are giving way to new impulses bred of modern business thinking where profits mean more than production. With such a change, it cannot be long before the industry will find a choice not limited, as President Bockus so aptly phrased it, to "the poorhouse or the penitentiary," but a choice which will open the way to placing coal upon a profit basis in keeping with its national importance.

NOTES

... from Across the Sea

PRECAUTIONS against roof falls in Great Britain are far more elaborate than those in the United States, yet some of them do not seem costly, especially as they may serve to keep in place tons of rock which it is expensive to stow away in the gob. One of these pieces of precautionary equipment is the steel strap, a piece of corrugated steel of various thicknesses and lengths; sometimes 3 ft. 6 in. long and sometimes 6 or 8 ft.; sometimes $\frac{1}{4}$, $\frac{3}{8}$, or even $\frac{1}{2}$ in. thick. The width usually is 5 in.

In Paper 61, recently published by the Safety in Mines Research Board of Great Britain (140 pp., 6x9 in., paper

brought forward. If the roof should fall by reason of the removal of the props *d*, only the machine is in jeopardy, and as the straps overhang only about 3½ ft., they are reasonably equal to the task of holding up the roof. If necessary, the straps could have been "needled" into the coal, though this apparently is not done in this instance, the strap itself being staunch enough, with the props so near the face, to hold up the roof rock.

With the props at *d* removed, the machine without interference can make the backward swing by which its cut is completed. The secretary of the Safety

in Mines Research Board in a communication informs me that, during the removal of the straps prior to their resetting, all four planks are maintained in position by first setting a temporary prop under the center of each. The end props under one of the steel straps are then knocked out. The strap is removed and the props are reset. After the second set of end props has been reset the temporary props are withdrawn. Obviously, this method of operation is safe but somewhat slow, so another method has been devised, shown in Fig. 2.

This setting and resetting of props has its difficulties and delays, and another plan has been proposed (see Fig. 2). Here two 3 in. x 3 in. x 12-ft. girders are supported at one end on posts set under the last cross timber and at the other by being needled into holes cut in the weak shale, or "clod," just above the coal face. Thus supported a timber can be laid on the girders and wedged from below so as to be in close contact with the roof. After the machine cut has been made and the machine removed, props are set under the cross timber and the girders are withdrawn. As the coal is loaded, a set of three timbers is erected where depicted by dashes on the line drawing. This plan is in use at collieries in the Cannock Chase district of South Staffordshire.

Straps are straightened in the coal fields of the North of England either at a furnace provided for that purpose or in a screw press that may be mounted on a car and taken around the mine where needed. The straightening in that case is done near the face and without heating the strap. Sometimes a hole is punched near the end of the strap to facilitate withdrawal, but it is of doubtful value and weakens the strap over the head of the prop where strength is most greatly needed. As the straps have to be handled the smoothness of their edges is important in order to avoid lacerations—a detail sometimes overlooked.

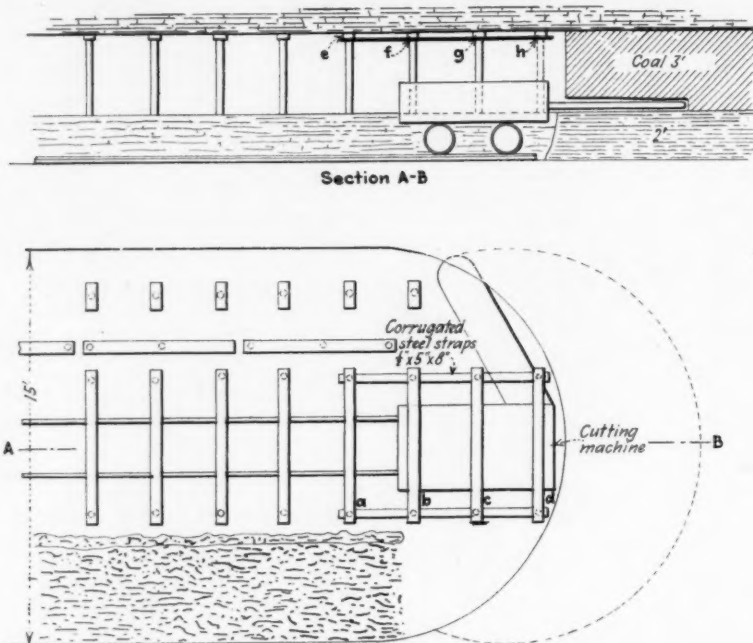
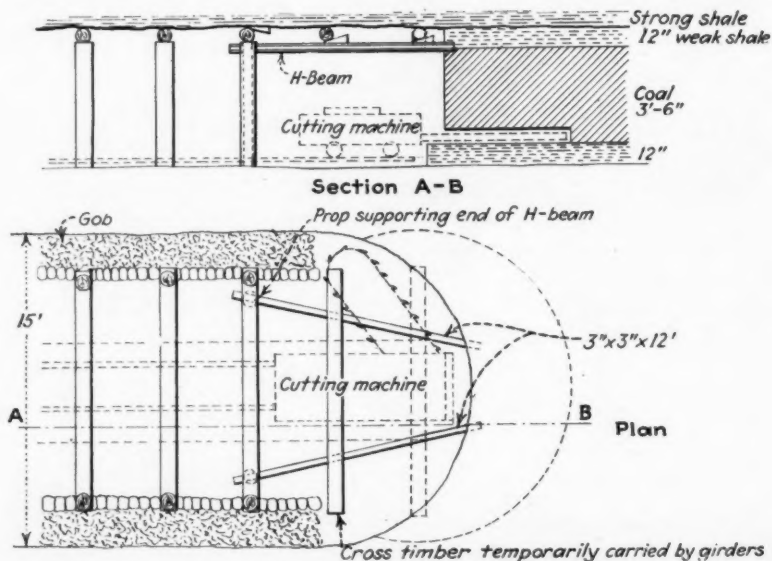


Fig. 1—Timbering Placed Close to Face

covers) and entitled "The Support of Underground Workings in the Coal-fields of the North of England," are described the timbering methods used in driving a place with a turret coal cutter (see Fig. 1).

In this working the steel straps used are of $\frac{1}{2}$ x5-in. cross-section and 8 ft. long. They stretch over three props—*a*, *b*, and *d*—and each pair of straps carries four planks—*e*, *f*, *g*, *h*. The front pair of props, it will be seen, are set up within a few inches of the curved face to protect the men while loading. The pair between *b* and *d*, namely *c*, are not yet put into place, because they would interfere with loading. When the loading is done, however, the props *c* are erected and the props *d* are removed, and the cutting machine is

Fig. 2—When Girders Are Needed Into Face, Much Labor Is Avoided



A mysterious failure of stemming to protect a shot, resulting in an explosion killing five men at the Allerton Bywater Colliery, Castleford, Yorkshire, has greatly puzzled the British inspectorate, according to the report of the Mines Department, just issued. The explosion occurred March 10, 1930. It was found that the shot had cracked the coal face but had nevertheless blown out part—the center part—of the stemming, so as to form a tube of clay around the bore of the hole. This clay tube was blackened on the inner face with coal dust, obviously from the part of the hole that had been in contact with the cartridge. Though the stemming had blown out, the explosive had done its work, for a horizontal fissure about $\frac{1}{4}$ in. wide had been broken through the center of the hole, and, furthermore, when the coal was carefully cut away it was found that some of the clay had been forced into the opening fissure, so that fins of clay were formed before the stemming was ejected and the pressure released. There were no breaks at the back of the hole through which the products of combustion could have escaped.

Strangely enough, this phenomenon

exhibited itself in several other shot-holes fired by the same man that morning. In one the tube of clay did not extend to the face of the coal but remained closed by a 6-in. plug, the tubular formation beginning at the inside of this plug. In six working faces one showed six instances where the explosive had done its work but had blown out its stemming on the sides and roof. The shots described were fired in the Silkstone seam. As tests could not be made in this bed, holes were drilled in the Beeston seam, the coal of which is somewhat stronger. Charges from 6 to 10 oz. of explosive were placed in 4-ft. holes and the clay used for stemming was of different consistencies and lightly tamped, but in no case was the stemming forced out in the manner described. The shotfirer being dead, it is difficult to discover the manner in which he tamped his holes. It is to be expected that further experiments will be made, for, as the report declares, such tests are desirable.

R Dawson Hall

◀◀ LETTER to the Editor

I have read with interest the article in your September issue by Thomas Fraser and Robert MacLachlan entitled "Probing Problems of Pneumatic Cleaning of Bituminous Coal." The major part of this article is devoted to the problem of screening small sizes of coal and to the effect of moisture on such screening; to the various methods used in handling and distributing these sizes to secure a balanced feed to the tables; and to the effect of wet coal on dry cleaning.

Unfortunately, the authors have based this entire article on the dry cleaning of coal over small deck tables. They have entirely disregarded the latest developments in pneumatic cleaning: namely, the Peale-Davis system, which utilizes very large table decks and cleans without presizing all coal within the range of sizes suited to mechanical preparation.

For example, at the plant of the Lincoln Gas Coal Co. near Washington, Pa., all coal from the mine below 5 in. is treated unsized at the rate of 350 tons per hour over one primary table, with one re-treatment table to handle rejects from the primary. This plant is giving day in and day out a clean coal of uniform analysis and remarkably close to the results theoretically possible at the specific gravity point selected on the washability curve as being the most economic point for cleaning. The problems of presizing, of distribution of the various sizes to be cleaned, of balancing hoppers for each size, of reassembling or rescreening to make sizes that correspond to the daily demands, and of

breakage resulting from so much handling of the clean coal, have been eliminated. This Lincoln Gas Coal Co. mine is a representative large-tonnage producer, with coal coming from widely scattered workings, some wet and some dry, and yet this variation in moisture has had no appreciable effect on the analysis of the cleaned coal.

Likewise at Mine No. 120 of the Consolidation Coal Co. at Acosta, Pa., a similar arrangement of Peale-Davis tables treating 2x0-in. coal at the rate of 300 tons per hour, is giving results close to the theoretically possible, and without harmful effects from the wet coal.

The same may be said of the Carbon Fuel Co. plant at Carbon, W. Va., where 250 tons per hour of 1x0-in. coal is being treated over Peale-Davis tables.

I have naturally used as examples plants engineered and built by the Fairmont Mining Machinery Co., because of first-hand information and knowledge of these. However, you will note that all three plants are treating different seams of coal in different coal fields and of different size feed to the tables. They are representative mines in these fields.

It is conceivable, of course, that such a volume of wet coal might be put over a Peale-Davis table as to impair its cleaning efficiency. However, I am not concerned with theories but with conditions as they actually exist. I wonder if this whole bugaboo about wet coal is the result of theorizing and possibly of experience with small tables, where the product is closely sized and of such small volume and thinly bedded as to

be sensitive to temporary changes in table feed. On the large-deck tables the area and thickness of bed and the time that the coal is on the table, together with the fact that pea, nut, and often egg coal are treated along with the fine slack, all tend to nullify any ill effects that might be expected of wet coal.

It must also be borne in mind that the percentage of wet coal coming from the average mine is small. There are few cases where it should be otherwise. From the standpoint of mining and transportation alone, no coal operator is going to have any more workings to the dip than is absolutely necessary, and this is particularly true in wet mines. The occasional car of wet coal in a trip is dumped into a hopper, fed—or perhaps conveyed—to the screens, the undersize conveyed to a bin and thence fed to the table, and in this travel there is some separation of particles and mixture with dry coal. Where such small sizes as 1 to 0 in. are treated on a Peale-Davis table, the chances are that some of the larger sizes are being crushed, which is a further help in distributing the moisture and reducing its concentration and effects on cleaning.

I am giving the above information to correct any false impression that might result from the reading of the article of Messrs. Fraser and MacLachlan. It is unfortunate that they overlooked the Peale-Davis system of pneumatic cleaning, which was developed to overcome the very difficulties set forth in their article.

M. L. O'NEALE,
Sales Manager, Mine Department,
Fairmont Mining Machinery Co.
Fairmont, W. Va.

Publications Received

Fire-Fighting Equipment and Organization of the Madison Coal Corporation, Glen Carbon, Madison County, Ill., by A. U. Miller. I. C. 6,323; 8 pp.

Some Hazards of Conveyor Loading in Coal Mines, by C. W. Jeffers. Bureau of Mines, Washington, D. C. I. C. 6,300; 6 pp.

Hazards and Protection of Underground Transformer Installations, by D. J. Parker. Bureau of Mines, Washington, D. C. I. C. 6,299; 3 pp.

Privately Owned Mine Rescue Stations, by R. D. Currie and C. W. Owings. Bureau of Mines, Washington, D. C. I. C. 6,304; 5 pp.

An Automatic Electric Man-Hoist for Slopes or Inclines, by S. H. Ash and E. M. Brooks. Bureau of Mines, Washington, D. C. I. C. 6,301; 3 pp., illustrated.

Danger to the Public From Abandoned Mine Workings and Other Property, by F. S. Crawford. Bureau of Mines, Washington, D. C. I. C. 6,296; 4 pp.

Rock-Dusting in the Coal Mines of the State of Washington, by S. H. Ash and John G. Schoning. Bureau of Mines, Washington, D. C. R. I. 3,015; 11 pp.

A New Flame Safety-Lamp Testing and Demonstration Apparatus, by W. P. Yant, L. B. Berger, and G. S. McCaa. Bureau of Mines, Washington, D. C. R. I. 3,017; 10 pp., illustrated. Describes a small box or gallery for testing lamps for defects and improper assembly before they are taken into the mine.

THE BOSSES

TALK IT OVER



Pillar Rides—

How Do You Prevent Them?

“**S**AY, Mac! How is that ride on Fifth Left coming along? Have you checked up on it lately?”

“No, I haven’t,” returned the foreman. “I’m afraid it’s going to give us a lot of trouble before we get it stopped, Jim. I don’t know what makes those pillars act like that sometimes. They’re manageable enough for a stretch, when up jumps the devil, and whispers to the roof: ‘Ride ’em, Cowboy; ride ’em.’ But I’ll catch the devil.”

“Right you are, Mac—when the Old Man hears about it—you sure will. But that’s not all. The track man on Fifth Left told me last night that the cut boss had them pull back the track in No. 15 room. Then the boss shot the slate and covered up that bad stump. He told the boys the stump would be hard to get; that by covering it up and marking it out on the map, no one would be wiser and they would save themselves a lot of work. The track man said that had been done before.”

“It looks to me as if you caught the devil yourself, Jim. But I’ll have the pleasure of telling him about it. Incidentally, we’ll have a new cut boss tomorrow.”

“That is all very well, Mac, but how will you know when all your cut bosses are taking pillars clean?”

WHAT METHODS DO YOU FOLLOW?

1. Do you place implicit trust in your cut bosses to take the pillars completely and post the extraction on the maps?
2. Or do you check up the pillars and post the extraction yourself?
3. Why not have the engineering department handle this job?
4. When a ride starts, what do you do?

All superintendents, foremen, electrical and mechanical men are urged to discuss the questions on page 680. Acceptable letters will be paid for ▶▶▶▶

Should a man's family be informed if he persists in following dangerous practices. The super told Mac in October that he intended to try this scheme. What the readers of *Coal Age* think about his idea is told in the letters following.

A Noble Experiment

CURBING a workman's carelessness by talking the matter over with his wife may in some instances be justified and effective. However, I feel that the average mine superintendent will agree with me that such a procedure may possibly introduce an additional hazard that is not mentioned either in the state regulations or in the schedule-rating "blue book," though none the less potential of trouble. And, from my observation and experience in mine management and accident prevention work for a period of over 25 years, I am inclined to feel that the super had better watch his step when he undertakes to inform friend wife of John's delinquencies.

While it is perhaps true that the average mine superintendent finds it necessary to take an active interest in the general welfare, and at times even in the home life, of his workmen, discussing the carelessness of the worker with his family is exercising a prerogative that borders dangerously close on encroachment into family affairs. Discussing the carelessness of Buck Evans with Buck Evans is one thing; talking it over with Buck's wife is another. In my opinion the superintendent in attempting to correct one evil, is introducing another.

Years ago, the writer, while in charge of a Pittsburgh district mine, had a tracklayer named—let us call him Zed Smith. Zed was a good trackman, and except for the first day or two immediately following pay day was a steady worker. However, with almost religious regularity Zed got drunk before going home with his wages on pay day. And, quite as regularly Zed's wife, who weighed perhaps 50 lb. more than Zed, gave him a beating when he did get home and put him to bed to sober up ready for work the next morning. And, strange as it may seem, this old trackman, who has been dead many years now, seemed to accept this as a natural procedure, though it never cured him. And I am not sure that waiting for Zed with a pickhandle because he had been careless at his work and came home limping would have cured him of carelessness either.

Every mine superintendent, of course, is best qualified to determine just how far he can go and to what extent any degree of paternalism may be exercised. The class of workmen, temperament, nationality, and other factors will de-

termine this. I have observed mine superintendents in some of the Southern states whose duties aside from management of the mine, were that of "legal advisor," father confessor, family peacemaker, and trouble adjuster generally. The class of workmen were such as were dependent and expectant of this. On the other hand, I have observed mining plants, particularly in the Middle West, where the workmen were of such a class and of such temperament as to discourage any tendency on the part of the superintendent to take such action as Super Jim contemplated. All of which must be taken into consideration in this, another, "noble experiment."

Houston, Pa. SIM C. REYNOLDS.

Decries Coercion of Worker By Causing Worry at Home

TRYING to coerce a worker through his family, with pleas behind his back, asking them to make him behave at the plant, appears to me as a weakness of the super and shows his inability to handle his safety problem. The proposed reports from the super would be overstepping management's prerogatives and encroaching upon the private life of an employee, causing worry and anxiety to his family as to his conduct forever after. There are many more appropriate and legitimate ways of gaining a workman's co-operation than by squealing on him at his home when he is careless at his work. It would be better for all concerned to keep away from a man's domestic circle.

Much of the unrest and trouble in the past has been brewed largely from the men's feeling that the company wants to own them body and soul—asking them among other things to trade at the company store and live in company houses. The whole scheme of control, they think, takes away a man's independence. In these modern days let a man live his private life and use sound judgment in handling him on the job. If he is careless in matters of safety but valuable in other respects, give extra attention to his faults to make him a good all-around man.

One of the most effective safety measures lies in the functioning of a safety committee consisting of the works manager, a safety engineer, the superintendent of each department, a safety inspector, and the plant physician. The

job of the safety inspector is to investigate each accident promptly and report his findings to the safety committee. They will, as a body, if the accident is serious, determine the facts and act at once to prevent a recurrence. This committee obtains the utmost co-operation from all the foremen, who are in immediate contact with the men and equipment.

I liked the safety court idea of the Consolidation Coal Co., described in the October issue of *Coal Age*, for it puts a lot up to the men themselves. That article was good and is worthy of study and preservation by any safety committee. CHARLES H. WILLEY,

Superintendent of Manufacturing.
Concord, N. H.

Complaints Are Justified If They Will Insure Safety

ANY measure is justifiable that will beget greater safety, even to the telling of a wife that her husband is careless in his work. It is a strange kink in human nature that a miner who knows better has to have a boss to take care of him at the working face. And, speaking of bosses and safety, many safety plans have to be passed up because of market conditions. If the salesman was instructed to include in his selling estimate all miscellaneous items in the cost of mining instead of only those which pay his salary and expenses, we would have better mines and be able to carry out our end of the safety program. Then perhaps we would not have to tell the Old Lady.

C. E. MONTGOMERY.

Edwight, W. Va.

Super Is a Real Salesman If He Puts Over His Idea

TO WIN every family in the community to the cause of safety is the aim of all safety engineers. The super, I take it, is not able to do much with some of his men, so he proceeds to call on the miner's family to help him sell the safety idea. His thought evidently is that Dad loves Mother and the children so much that they will be able to hit a responsive chord which the mine officials have never been able to reach. We appreciate the bond of love and devotion existing between every man and his family, and we strive to interest the children in the business of mining through lectures in public schools. In our talks we give them many things to take home for discussion around the family fireplace. This is one of our ideas of getting the family interested.

Further, we make no compromise on

the job in matters of safety. A safe practice is always the best we know. If a man fails to understand or appreciate what we believe to be recognized safe practices, we tell him in such a way that he does appreciate and understand.

The super will have to be a real salesman when he tries to sell the family the idea that the husband and father needs some home training. His idea will be hard to sell because in the very first place it is against the first law of human relations, which is to treat people as you'd be treated. The super's plan, to say the least, sounds roughshod (personally, I'd prefer to have it out with the man) and where he should get kind consideration he will more often get silent opposition and even open rebuke. The good miner just wouldn't stand for it. The average miner might have to, but he would surely resent it. In fact the type of man who wouldn't resent it would be the kind that has no pride and is just the kind we should get rid of. Further, the type of fellow who will not yield to the instructions of the foreman doesn't have much of a salesman in the kitchen at home.

Paintsville, Ky. GEORGE EDWARDS.

Urges Plan Despite Objections

I AM with the super, and I feel that his plan is a good one. Certainly, it is worth a trial. No doubt he will get many a bawling out, but at the same time he will receive many thanks from those who benefit by his actions. The fact that his idea is not well received by everybody should not deter him from an attempt to put it in force. New ideas for the promotion of safety are scarce. This one promises to bring results, and I am for it.

S. J. HALL.

Stickney, W. Va.

Officials Should Obey Law

As an Example to Workers

THE action of the super will most assuredly be resented by employees as a whole. No real man needs twice telling of his carelessness. It is the super's duty to tell his employees of any carelessness on their part, either verbally or otherwise, but don't belittle them by reporting their actions to members of their family. A better plan to prevent accidents is to schedule numerous safety assemblies and have them attended by the employees and members of their families, as prevention is better than cure.

No one can do more to prevent accidents than the mine officials can by keeping the law and doing their duty. Such safety signs as "Obey the Law and Avoid Trouble" are O.K. if the persons who post them govern themselves accordingly. I find more cause for complaint against mine officials as a group than against employees, because the former are certified and have the advantage of education and thorough

Do You Know?

Not all rides are on horseback. Sometimes they are on coal pillars. Who is responsible for them? Here is a problem with a strong flavor of the underground. For further details read p. 680, and then send in your answer.

experience. Mining laws direct certain regulations and practices to be followed by underground officials. But too often these are neglected.

Linton, Ind.

W. H. LUXTON.

Plan Is Practicable, but—

THE intriguing suggestion of the super that man-dominated coal mining be made accessible to the titivating fingers of those who rock the cradle, and therefore rule the world, gets a lusty shout of approval from me. Why not? Wasn't it Queen Isabella of Spain who, by pawning her jewels, made it possible for Columbus to discover America?

Count Von Keyserling characterized the United States as a matriarchy, and yet we have succeeded in building a Chinese wall around an industry that offers a world of scope to the ingenuity and resourcefulness of our modern Portias. And that, my brothers, is what may be the matter with our industry, if the reason is still being sought. Coal operators throughout the country would do well to ponder the amazing potentialities of this new horizon.

However, the super's innovation will cause much uneasiness, though its effectiveness cannot be gainsaid. How to apply the plan to get the best results is something else again. To boldly walk up to the door while Smith is at work and address his lady in her castle with a hint that her spouse is somewhat tardy in setting props is fraught with uncertainties. An appeal to the diplomatic service seems in order. There may be a moral somewhere in the following incident:

In this community, as in most places, the drive for merchantable fuel has been indefatigable and insistent. To this end one never knew just when one's car would be yanked off at the lower landing and carefully scrutinized for impurities. One fine morning the coal inspector ordered a car set off for inspection, and this disclosed an unusual quantity of bone and fireclay. On coming to work the following morning the offending party found his life check held up, and on inquiry as to the reason was confronted by the damning evidence. He was asked what he thought of the contents of the car. He bluffed loudly that he didn't see anything the matter

with it. Well, would he care to buy this coal at the usual price? Thus cornered, he promptly assented to the proposal, and continued on his way to work.

His wife, totally unaware of the incident, was busy in the kitchen when the teamster drove up to the coal house and began dumping the coal into the shed. Perplexed that her husband had failed to apprise her of his intention of ordering a coal supply, she ambled out to oversee the unloading ceremony. Her eyes narrowed as she saw the liberal percentage of bone and fireclay shoot past her, and they fairly snapped as she peremptorily ordered the teamster to take the rock back to where he got it, as she had no money to throw away, and added that she could get such truck at the dirt dump for nothing if she ever wanted it.

That the women in most mining communities are very well versed in the affairs of the mine at which their men folks are employed must be admitted. That they play a not inconsiderable part in the local politics where placing the men and the attitude of the supervisory force toward the personnel is concerned is only too true. That this active interest will be carried to the limit suggested by the super is within the realms of practicality, I will admit.

"Can you suggest alternate action?" you ask. "Yes, yes," we hasten to add hopefully, with a hasty glance over our shoulder. "Let us tear out this page from *Coal Age* before Diana's eagle eye notes the breach for the entering wedge."

ALEXANDER BENNETT.

Panama, Ill.

Mother Made a Mistake

MOTHER was our first and best safety engineer. She managed to bring us through the hazards of childhood, but as we grew older she relaxed in her command, not through carelessness but through the thought that we had outgrown her advice. To my mind, right here is where she made a big mistake.

Instead of relaxing, she should have learned more of the hazards of our work and continued to direct our safety, just as she did when we were children. A few kind words to Dad and the children each morning about personal safety would help guide our minds in a channel of safer thinking.

So we can see why the super wants to enlist mother on his side in the cause of safety. But the super will get nothing but ill-will from the majority of families if he resorts to cold-blooded methods. In this I'd never trust a business letter to sell such a splendid idea. It should be handled personally by the super and approached with tact. Personally, I'd rather sell the idea to the group through the P.T.A. or safety rallies, and lastly in a personal way.

ADRIAN KENNETH DAUGHERTY.

Paintsville, Ky.

Perhaps the Electrician Is at Fault; Who Knows?

INEFFICIENT electricians, unable to keep up their end of the work, usually try to lay the blame on machine men and motormen. On the other hand, there are machine men and motormen who really do abuse their machines. Consequently, I invariably listen to the reports of electricians and investigate the matter myself. Any reasonable foreman will do as much.

A wise electrician will report these things to the foreman and not make enemies by taking steps on his own initiative. A machine man who wants to hold down his job knows that he must take proper care of the equipment and do all within his power to keep it going.

R. C. MITCHELL.

Milburn, W. Va.

Seeks Method to Combine Best Features of Three Plans

MEN working for a daily wage lose interest and become sluggish unless some influence can be brought to bear which will stimulate extra and enthusiastic effort. Work on this basis requires the spur of close supervision and constant drive to prevent a lagging pace. There are, of course, outstanding individuals who do their level best even under the daily-wage system, but such men generally are pointing their way to jobs of bossing or other promotion or favor which, in their case, provides the required stimulus. The unrelaxing supervision necessary to produce maximum results under a straight day-wage system is, as everyone familiar with mining knows, more difficult of accomplishment in mine operation than under factory conditions.

On the other hand, the tonnage rate payment in coal mines carries in its wake a train of unsatisfactory accompaniments. Physical conditions in coal mines are not equal and tonnage rates have but loosely followed the existing inequalities, as, for instance, the extra rate provided for extremely thin coal or for horsebacks, etc. For this reason many operations have begun and continue to operate which, under other and fairer competitive labor conditions, would not be plaguing the industry at the present time.

Any mining man can recall variations of operating conditions wherein loaders, expending nearly twice the energy of others, receive the same rate per ton. Cutting machine operators paid by the ton vary widely in their earning capacity because of differing thicknesses of veins or because of dissimilar cutting conditions.

Operators of mines have fallen into the error of loose and inefficient practices oftentimes because employees paid on a piece-work basis seemed to be costing them nothing while idle. They forget that every working place in the mine represents a cost to provide and

maintain; that, after all, the per-ton rates are established and fixed on the basis of past earnings, including in this scope all the customary inefficient practices featured in past experience.

The overcrowding of mines, the consequent waiting for cars, the carelessness in maintenance of machinery, poor track, half-hearted drainage, dilatory methods in providing supplies, lack of progress in bettering the methods and machinery used in coal mining, all are largely chargeable to the piece-work system of coal mining and are responsible for the backwardness and inefficiencies with which the industry has been so often charged. Besides this, it has been difficult to obtain a proper discipline of the piece worker, since he has exercised the privilege of quitting work at any hour of the day which suited his fancy. This has resulted in much bickering and labor trouble and is chiefly responsible for the overcrowding mentioned above.

In spite of the fact that the piece-work method should, and does, influence the degree of pep and zest which men put into their work, it is also a fact that most men will not drive themselves to make their best effort. Most of the hurry and flurry of this class of workers, which the writer has observed, springs from the effort to finish a measured task in the shortest possible time, not because of a desire to accomplish more but

in order to shorten the eight-hour day to a six- or a four-hour day. It is a sad commentary on human nature that it just cannot endure prosperity if such prosperity is to be won at the expense of great personal effort.

Is there no method by which the good features of these contrasting wage systems can be retained and the bad ones eliminated? It has seemed to the writer that some such method would some day be made applicable to mining conditions. For the sake of efficient and progressive practices on the part of the operator, let us have daywork. And for the sake of efficient and zestful effort on the part of the workman let us have a tonnage rate too, or at least a day wage plus a bonus based on performance.

The application of such a bonus is not generally easy, though in some cases it is quite simple. For instance, take a loading machine crew in mechanical operation. This crew may consist of ten men and each of the ten is a very definite item in the performance of this loading machine. His work contributes directly to the results obtained, and a bonus should be allotted to each member of the crew whenever the tonnage produced by this unit exceeds a predetermined amount.

Consider the case of those workers whose task is of a more general nature, such as main-line haulage, caging, coupling, pumping, hoisting, tipples, etc. It seems to the writer that the bonus should be applied for other than merely tonnage production which is originated by others. A bonus dealing more particularly with the degree of efficiency obtaining in their particular department should be the principal measure determining their right to a bonus. Freedom from mechanical breakdown, saving in the cost of repairs and supplies, and labor cost of the various departments should be given consideration. Give the man an interest in doing his work well and economically. Men in high positions who expect to be properly rewarded for outstanding performance often forget that even the most lowly subordinate can be stimulated or withered in accordance with the appreciation and monetary reward he receives for extra effort.

When a working crew is rewarded with a bonus for performance applying to each member of the crew, lagging members are prodded by their associates who are more ambitious, and this helps to solve the difficult and onerous duties of superintendence. The bonus wage system seems the most equitable and the most logical, since the employer pays most when he profits most and the employee is justly rewarded for applying extra effort and extra forethought to his job. At the same time control and discipline of the entire working force is at all times in the hands of the employer.

Further discussion and study of this subject is sure to provide some interesting food for thought and I shall take pleasure in reading all the letters on this subject.

W. E. BUSS,
Vincennes, Ind. Mining Engineer.

Recent Patents

Blasting Device; 1,772,994. Frank A. Halverson, Glen Richey, Pa. Aug. 12, 1930.

Loading Machine; 1,762,072. Norton A. Newdrick, Columbus, Ohio. June 3, 1930.

Reclosing Mechanism for Circuit Breakers; 1,762,298. A. L. Hosner, Telluride, Colo. June 10, 1930.

Coal Pulverizer; 1,762,379. Harry H. Bates, Ridley Park, Pa., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. June 10, 1930.

Apparatus for Rock-Dusting Mines; 1,764,113. James B. Miller, St. Louis, Mo., assignor to American Mine Door Co., Canton, Ohio. June 17, 1930.

Pit Prop; 1,765,200. Enoch Bullough, Ashton-in-Makerfield, England. June 17, 1930.

Mining-Machine Truck; 1,765,400. George Bodin, Chicago, assignor to Goodman Mfg. Co., Chicago. June 24, 1930.

Mining Machine; 1,765,528. Walter S. Gray, Chicago, assignor to Goodman Mfg. Co., Chicago. June 24, 1930.

Coal Cutter; 1,765,529. Michael Hardick, Punxsutawney, Pa., assignor to Goodman Mfg. Co., Chicago. June 24, 1930.

Brattice; 1,766,324. Vernon T. Berner, Ray, Ariz. June 24, 1930.

Mining Machine; 1,766,395. Frederick B. Miller, Scottdale, Pa. June 24, 1930.

Dirt and Dust Remover for Mining Machines; 1,766,429. Thomas J. Cromble and Robert C. Cromble, California, Pa. June 24, 1930.

Blasting Method and Tamping Cartridge With Utilization of Liquefied Gases; 1,767,181. Leopold Lisse, Berlin-Lichterfelde, Germany. June 24, 1930.

Car Retarder; 1,767,440. Louis E. Endsley, Pittsburgh, Pa., assignor to Fort Pitt Mine Equipment Co., Pittsburgh, Pa. June 24, 1930.

Lamp Holder for Miners' Caps; 1,768,201. Eli Israel, Wilkes-Barre, Pa., June 24, 1930.

Explosive Cartridge and Method of Loading High Explosives in Drill Holes; 1,763,407. Otto B. Niesen, Allentown, Pa., assignor to Trojan Powder Co., New York City, N. Y. June 10, 1930.

OPERATING IDEAS

From PRODUCTION, ELECTRICAL And MECHANICAL MEN



Drilling and Blasting Expedited By Special Shot-firer Cars

A GROWING desire for the establishment of greater safety in coal mining and the increasing demand for maximum percentages of prepared sizes are causing operators in every coal producing section of the country to employ shot-firers in a change from the older custom of letting the men at the face do their own shooting. By having all the holes loaded, tamped and fired by a few picked men, the operator establishes a control over the shooting of coal. In no two states are the mine laws exactly alike, and in no two mines are conditions the same. For this reason, a standard system of shot-firing cannot be established for universal use. In a recent issue of the Du Pont Explosives Service Bulletin a number of systems of shot-firing are suggested by Alfred L. Milligan.

One of the systems set forth calls for the employment of a shot-firer and an assistant who do the drilling, charging and firing on the night shift, the removal of bugdust from the undercut being attended to prior to their visit to the working face. These two men are provided with a specially constructed car for explosives, stemming material and drills and also with a locomotive. With these means of transportation they get around the mine with considerable speed and can shoot down

as many as 35 places in a shift of 8 hours even in some of the hard-drilling splint seams of coal.

The car used for this purpose is shown photographically in Fig. 1, and is detailed in Fig. 2. It is attached to the locomotive through an insulated coupling and is made in three compartments. One of these is covered and insulated and is devoted to the storage of explosives. The second compartment carries dummies for loose

the other of two troughs located on the sides of the car.

In the operation the locomotive and car are taken to within about 15 ft. of the face by either storage battery or reel, these sources of power serving the drill. While the shot-firer charges and tamps the holes, his assistant files

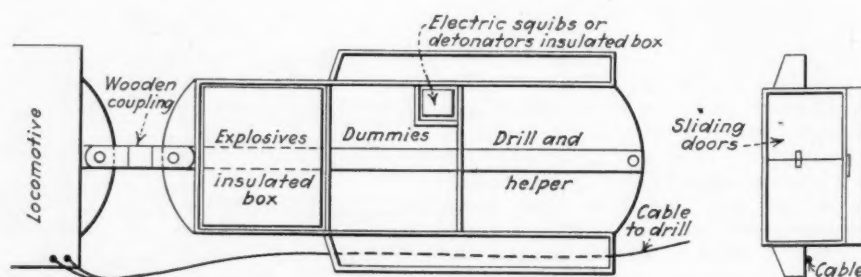


Fig. 2—Details of Combination Car

stemming material. In one corner of it is built a covered insulated box for electric squibs or detonators where permissible explosives are used. The third space seats the assistant and accommodates an electric drill. Drill bits, tamping rods, and bar are held in one or

the drill bits to have them sharp for drilling the next place. After the holes are tamped, the locomotive and car are moved back to a safe distance from the working face and then the holes are fired. In some cases all of the holes on an entry are loaded before any of them is fired.

In the design of the car already described, it is important that the opening to the explosives box be placed either on the side or on the end. This precaution avoids any danger of a spark from the trolley or of the electric cable coming in contact with the explosives in the event the box is left open. To safeguard against this danger, some operators employ two separate crews of two men each, and provide each crew with a locomotive and a car. In this case the first crew does the drilling only, and the second crew the loading and firing. In this arrangement the explosives car has no electrical connection

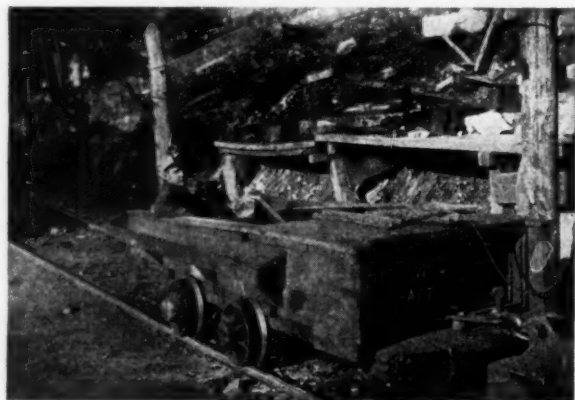


Fig. 1—Combination Car
for Explosives
and Drilling Equipment

with the locomotive pulling it. Usually the second crew cleans out the bugdust from the undercut in addition to loading and firing the shots.

Where no locomotive is available for use by the shot-firer, the type of car indicated in Fig. 3 is used. As the car is pushed by hand, it should be constructed as light as possible and the wheels should be large. This car is equipped with a reel for the drill cable, which is played out by hand as the car is pushed up to the face. In general, the duties and methods followed by this crew are substantially the same as those

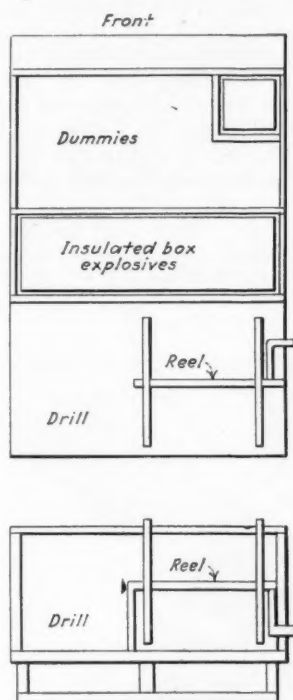


Fig. 3—Hand-Propelled Car

described for the combination drilling and shooting crew. In some mines the two-crew system is used with the hand-propelled cars. In their general design these cars are similar to those hauled by locomotives.

Any one of these systems can be used where blasting is either by pellet powder or permissible explosives. When the hand-propelled cars are used, shooting can be done during the day shift, but when the cars are hauled by locomotives the operation is performed at night. Locomotives are a practical necessity for blasting crews where grades are steep and where the workings are scattered. Their use, however, involves certain dangers which must be guarded against.

When fuses are used, the men may not pull the motor and car back to a zone of safety until the first of the holes in a place is lighted or until all of them are lighted. The danger in this instance is that the motor may fail, which means that the car cannot be moved until after the blast has occurred. Another danger is inherent in the

tendency of the men to see how fast they can make their rounds with the locomotive. That is why it is necessary to exercise judgment in selecting careful men for the shot-firing crew. The hand-propelled cars in the two-crew system are the safest and should be employed where conditions are favorable.

Three-Section Checks Trace Armature Service

In order to put his finger on faulty machines, expensive armatures, and abnormal conditions affecting armature life, the chief electrician or chief maintenance man for a group of mines should have records of locations, shop repairs, and performances of all armatures. When compiled by ordinary methods the considerable clerical work involved often results in giving up the keeping of such records. The accompanying illustration shows an armature performance and location tag recently adopted at a group of bituminous mines where the chief electrician is without clerical help.

Each tag, $3\frac{1}{2} \times 6\frac{1}{4}$ in., carries a serial number which is repeated on each of the three sections. When a mine electrician removes an armature and sends it to the central repair shop he attaches a tag but tears off the bottom section, fills in the brief data required and sends the section to the chief electrician. After repairs are completed, the shop foreman fills

125	
Mine No. _____	Arm. No. _____
Put in _____	Date _____
Condition: _____	
Winder _____ Arm. No. _____	
Type _____	
Repairs Necessary: _____ 125	
Material Used: _____	
Hours _____ Date finished _____	
Mine No. _____	Arm. No. _____
From _____	Date _____
Cause: _____	125

Upper Section of Tag Remains on Armature Until It Is Reinstalled

out the center section of the tag, tears it off, and sends it to the chief electrician. When finally the armature is put back into use, perhaps after lying in stock for a while, the third section of the tag, which has remained attached to the armature, is filled in and sent to the chief electrician.

The first tags were printed without serial numbers. This arrangement, however, caused difficulty because, through carelessness or due to battered numbers on the shafts, the three parties would not always record the armature serial number as the same. The sections of a tag were then difficult to match up when being grouped for filing in the office.

The file of tags contains readily available information concerning performance of individual armatures, life of armatures in individual machines, repair material and labor, location of armatures, and quality of work being done by each winder.

I'm Stumped

For an engineer, mechanic, or electrician to say to his boss "I'm stumped" should not always be a reflection on the man. But unfortunately, that almost invariably is the outcome. There are times in every man's workaday life when he must bow in defeat. Those occasions, however, can be minimized—in coal mining work by closely following the operating ideas published regularly in *Coal Age*. You are a reader of these pages; but are you also a contributor? Each status brings its reward. Accepted ideas, illustrated where necessary, are paid for, the minimum rate being \$5 each.

Condemned Hose Purchased For Wire Crossings

For the protection of light and telephone wires where they cross over mine trolleys and feeders, rubber hose serves nicely, but does not find wide use, because of the cost. At the Millers Creek division of the Consolidation Coal Co., Van Lear, Ky., factory condemned hose of $\frac{1}{2}$ -in. size is purchased for the purpose. This is obtained at approximately

one-third the cost of guaranteed hose. It cannot, however, always be obtained on short notice; therefore, a supply for a number of months is purchased when the factory reports some available.

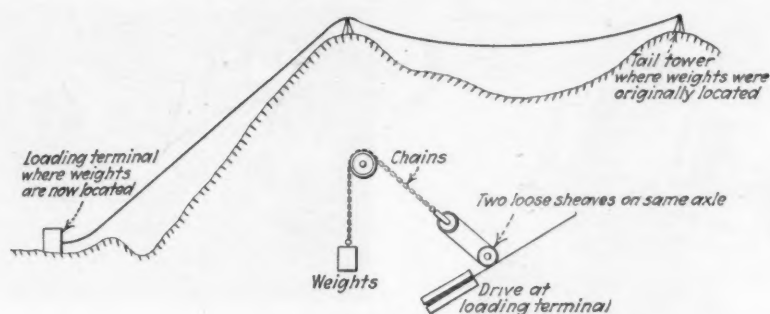
Perch-Foot Conversion Table Saves Time in Title Work

Title work and farm surveys frequently involve deeds of properties written years ago. Old-time deeds give

measurements of land in perches, which means that considerable labor must be expended in converting them to feet, the unit used in modern practice. This task can be accurately and conveniently accomplished by the use of the accompanying conversion table compiled by Robert A. Ramsay, chief engineer, Irwin Gas Coal Co., Greensburg, Pa. Engineers, surveyors, and mine officials will find use for this table.

CONVERSION TABLE, PERCHES TO FEET

Tenths of Perches										
Perches	0	1	2	3	4	5	6	7	8	9
0	0.00	1.65	3.30	4.95	6.60	8.25	9.90	11.55	13.20	14.85
1	16.50	18.15	19.80	21.45	23.10	24.75	26.40	28.05	29.70	31.35
2	33.00	34.65	36.30	37.95	39.60	41.25	42.90	44.55	46.20	47.85
3	49.50	51.15	52.80	54.45	56.10	57.75	59.40	61.05	62.70	64.35
4	66.00	67.65	69.30	70.95	72.60	74.25	75.90	77.55	79.20	80.85
5	82.50	84.15	85.80	87.45	89.10	90.75	92.40	94.05	95.70	97.35
6	99.00	100.65	102.30	103.95	105.60	107.25	108.90	110.55	112.20	113.85
7	115.50	117.15	118.80	120.45	122.10	123.75	125.40	127.05	128.70	130.35
8	132.00	133.65	135.30	136.95	138.60	140.25	141.90	143.55	145.20	146.85
9	148.50	150.15	151.80	153.45	155.10	156.75	158.40	160.05	161.70	163.35
10	165.00	166.65	168.30	169.95	171.60	173.25	174.90	176.55	178.20	179.85
11	181.50	183.15	184.80	186.45	188.10	189.75	191.40	193.05	194.70	196.35
12	198.00	199.65	201.30	202.95	204.60	206.25	207.90	209.55	211.20	212.85
13	214.50	216.15	217.80	219.45	221.10	222.75	224.40	226.05	227.70	229.35
14	231.00	232.65	234.30	235.95	237.60	239.25	240.90	242.55	244.20	245.85
15	247.50	249.15	250.80	252.45	254.10	255.75	257.40	259.05	260.70	262.35
16	264.00	265.65	267.30	268.95	270.60	272.25	273.90	275.55	277.20	278.85
17	280.50	282.15	283.80	285.45	287.10	288.75	290.40	292.05	293.70	295.35
18	297.00	298.65	300.30	301.95	303.60	305.25	306.90	308.55	310.20	311.85
19	313.50	315.15	316.80	318.45	320.10	321.75	323.40	325.05	326.70	328.35
20	330.00	331.65	333.30	334.95	336.60	338.25	339.90	341.55	343.20	344.85
21	346.50	348.15	349.80	351.45	353.10	354.75	356.40	358.05	359.70	361.35
22	363.00	364.65	366.30	367.95	369.60	371.25	372.90	374.55	376.20	377.85
23	379.50	381.15	382.80	384.45	386.10	387.75	389.40	391.05	392.70	394.35
24	396.00	397.65	399.30	400.95	402.60	404.25	405.90	407.55	409.20	410.85
25	412.50	414.15	415.80	417.45	419.10	420.75	422.40	424.05	425.70	427.35
26	429.00	430.65	432.30	433.95	435.60	437.25	438.90	440.55	442.20	443.85
27	445.50	447.15	448.80	450.45	452.10	453.75	455.40	457.05	458.70	460.35
28	462.00	463.65	465.30	466.95	468.60	470.25	471.90	473.55	475.20	476.85
29	478.50	480.15	481.80	483.45	485.10	486.75	488.40	490.05	491.70	493.35
30	495.00	496.65	498.30	499.95	501.60	503.25	504.90	506.55	508.20	509.85
31	511.50	513.15	514.80	516.45	518.10	519.75	521.40	523.05	524.70	526.35
32	528.00	529.65	531.30	532.95	534.60	536.25	537.90	539.55	541.20	542.85
33	544.50	546.15	547.80	549.45	551.10	552.75	554.40	556.05	557.70	559.35
34	561.00	562.65	564.30	565.95	567.60	569.25	570.90	572.55	574.20	575.85
35	577.50	579.15	580.80	582.45	584.10	585.75	587.40	589.05	590.70	592.35
36	594.00	595.65	597.30	598.95	600.60	602.25	603.90	605.55	607.20	608.85
37	610.50	612.15	613.80	615.45	617.10	618.75	620.40	622.05	623.70	625.35
38	627.00	628.65	630.30	631.95	633.60	635.25	636.90	638.55	640.20	641.85
39	643.50	645.15	646.80	648.45	650.10	651.75	653.40	655.05	656.70	658.35
40	660.00	661.65	663.30	664.95	666.60	668.25	669.90	671.55	673.20	674.85
41	676.50	678.15	679.80	681.45	683.10	684.75	686.40	688.05	689.70	691.35
42	693.00	694.65	696.30	697.95	699.60	701.25	702.90	704.55	706.20	707.85
43	709.50	711.15	712.80	714.45	716.10	717.75	719.40	721.05	722.70	724.35
44	726.00	727.65	729.30	730.95	732.60	734.25	735.90	737.55	739.20	740.85
45	742.50	744.15	745.80	747.45	749.10	750.75	752.40	754.05	755.70	757.35
46	759.00	760.65	762.30	763.95	765.60	767.25	768.90	770.55	772.20	773.85
47	775.50	777.15	778.80	780.45	782.10	783.75	785.40	787.05	788.70	790.35
48	792.00	793.65	795.30	796.95	798.60	800.25	801.90	803.55	805.20	806.85
49	808.50	810.15	811.80	813.45	815.10	816.75	818.40	820.05	821.70	823.35
50	825.00	826.65	828.30	829.95	831.60	833.25	834.90	836.55	838.20	839.85
51	841.50	843.15	844.80	846.45	848.10	849.75	851.40	853.05	854.70	856.35
52	858.00	859.65	861.30	862.95	864.60	866.25	867.90	869.55	871.20	872.85
53	874.50	876.15	877.80	879.45	881.10	882.75	884.40	886.05	887.70	889.35
54	891.00	892.65	894.30	895.95	897.60	899.25	900.90	902.55	904.20	905.85
55	907.50	909.15	910.80	912.45	914.10	915.75	917.40	919.05	920.70	922.35
56	924.00	925.65	927.30	928.95	930.60	932.25	933.90	935.55	937.20	938.85
57	940.50	942.15	943.80	945.45	947.10	948.75	950.40	952.05	953.70	955.35
58	957.00	958.65	960.30	961.95	963.60	965.25	966.90	968.55	970.20	971.85
59	973.50	975.15	976.80	978.45	980.10	981.75	983.40	985.05	986.70	988.35
60	990.00	991.65	993.30	994.95	996.60	998.25	999.90	1,001.55	1,003.20	1,004.85
61	1,006.50	1,008.15	1,009.80	1,011.45	1,013.10	1,014.75	1,016.40	1,018.05	1,019.70	1,021.35
62	1,023.00	1,024.65	1,026.30	1,027.95	1,029.60	1,031.25	1,032.90	1,034.55	1,036.20	1,037.85
63	1,039.50	1,041.15	1,042.80	1,044.45	1,046.10	1,047.75	1,049.40	1,051.05	1,052.70	1,054.35
64	1,056.00	1,057.65	1,059.30	1,060.95	1,062.60	1,064.25	1,065.90	1,067.55	1,069.20	1,070.85
65	1,072.50	1,074.15	1,075.80	1,077.45	1,079.10	1,080.75	1,082.40	1,084.05	1,085.70	1,087.35
66	1,089.00	1,090.65	1,092.30	1,093.95	1,095.60	1,097.25	1,098.90	1,100.55	1,102.20	1,103.85
67	1,105.50	1,107.15	1,108.80	1,110.45	1,112.10	1,113.75	1,115.40	1,117.05	1,118.70	1,120.35
68	1,122.00	1,123.65	1,125.30	1,126.95	1,128.60	1,130.25	1,131.90	1,133.55	1,135.20	1,136.85
69	1,138.50	1,140.15	1,141.80	1,143.45	1,145.10	1,146.75	1,148.40	1,150.05	1,151.70	1,153.35
70	1,155.00	1,156.65	1,158.30	1,159.95	1,161.60	1,163.25	1,164.90	1,166.55	1,168.20	1,169.85
71	1,171.50	1,173.15	1,174.80	1,176.45	1,178.10	1,179.75	1,181.40	1,183.05	1,184.70	1,186.35
72	1,188.00	1,189.65	1,191.30	1,192.95	1,194.60	1,196.25	1,197.90	1,199.55	1,201.20	1,202.85
73	1,204.50	1,206.15	1,207.80	1,209.45	1,211.10	1,212.75	1,214.40	1,216.05	1,217.70	1,219.35
74	1,221.00	1,222.65	1,224.30	1,225.95	1,227.60	1,229.25	1,230.90	1,232.55	1,234.20	1,235.85
75	1,237.50	1,239.15	1,240.80	1,242.45	1,244.10	1,245.75	1,247.40	1,249.05	1,250.70	1,252.35
76	1,254.00	1,255.65	1,257.30	1,258.95	1,260.60	1,262.25	1,263.90	1,265.55	1,267.20	1,268.85
77	1,270.50	1,272.15	1,273.80	1,275.45	1,277.10	1,278.75	1,280.40	1,282.05	1,283.70	1,285.35
78	1,287.00	1,288.65	1,290.30	1,291.95	1,293.60	1,295.25	1,296.90	1,298.55	1,300.20	1,301.85
79	1,303.50	1,305.15	1,306.80	1,308.45	1,310.10	1,311.75	1,313.40	1,315.05	1,316.70	1,318.35
80	1,320.00	1,321.65	1,323.30	1,324.95	1,326.60	1,328.25	1,329.90	1,331.55	1,333.20	1,334.85
81	1,336.50	1,338.15	1,339.80	1,341.45	1,343.10	1,344.75	1,346.40	1,348.05	1,349.70	1,351.35
82	1,353.00	1,354.65	1,356.30	1,357.95	1,359.60	1,361.25	1,362.90	1,364.55	1,366.20	1,367.85
83	1,369.50	1,371.15	1,372.80	1,374.45	1,376.10	1,377.75	1,379.40	1,381.05	1,382.70	1,384.35
84	1,386.00	1,387.65	1,389.30	1,390.95	1,392.60	1,394.25	1,395.90	1,397.55	1,399.20	1,400.85
85	1,402.50	1,404.15	1,405.80	1,407.45	1,409.10	1,410.75	1,412.40	1,414.05	1,415.70	1,417.35
86	1,419.00	1,420.65	1,422.30	1,423.95	1,425.60	1,427.25	1,428.90	1,430.55	1,432.20	1,433.



Indicating the Changes

of the same general type also was changed in regard to the location of traction cable counterweights.

Drill Gas Escape Holes to Make Jack Pipes Explosion-Proof

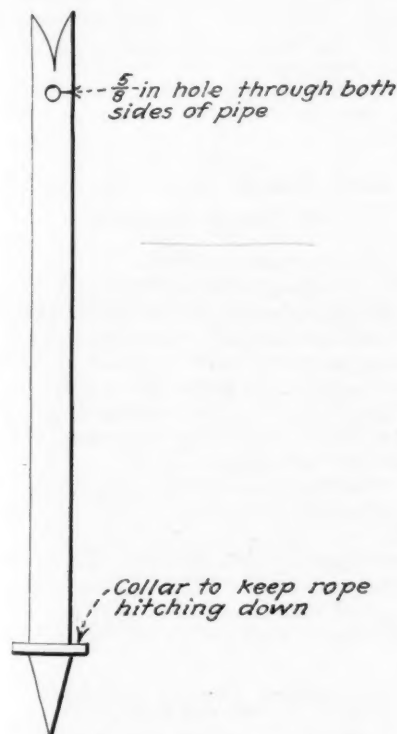
As the result of a peculiar accident at the Beech Bottom mine of the Windsor Power House Coal Co., near Wheeling, W. Va., a change has been made in the specifications of the mining machine jack pipes.

According to E. S. Wade, superintendent, the accident which seriously burned a blacksmith was caused by the sudden escape and ignition of gases dis-

top, thus closing the hole. Next he heated the body of the pipe for straightening. When at a red heat, gas pressure inside of the pipe caused it to split open for a distance of several inches. The escaping gas ignited and projected a sheet of flame against the blacksmith.

As a precaution against a repetition of this type of accident, it is now required that all jack pipes have a $\frac{5}{8}$ -in. hole drilled through both walls at a point close to the upper end. This will allow gradual escape of gases that may be distilled when heating a pipe containing coal dust.

The jacks are made from 2-in. extra heavy pipe. They are 6 ft. in length and are used in coal averaging 54 in. in thickness. Close to the bottom of the pipe there is a collar which prevents the mining machine rope hitching from slipping up and loosening the jack.



Jack Pipe Which Should Not Explode

filled from coal dust which had accumulated inside of the pipe. The jack had been used for some time after one of the points at the top had broken off, leaving a hole for the entrance of coal dust. When the pipe became bent it was sent to the blacksmith for repairing.

He first made a new point at the

Loader Tonnage Recorded On Wall Map

An old Chinese proverb states that one picture is sometimes more effective than ten thousand words in putting

across an idea or a situation to the mind. So with the use of charts for making immediately accessible the interpretation of production data. A chart gives an instantaneous picture of results that can be gained from figures only by slow, laborious effort.

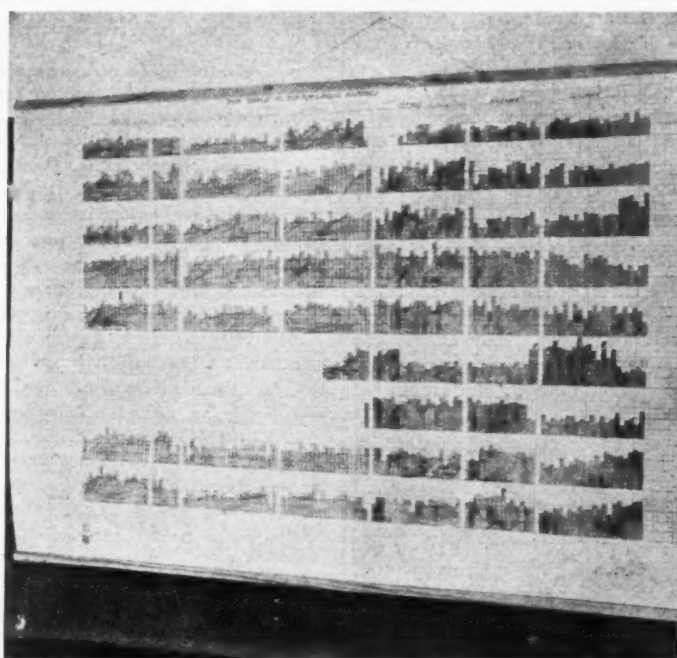
At the Valier (Ill.) mine of the Valier Coal Co. daily tonnage figures covering the operation of loading machines are plotted on a large sheet which hangs in the superintendent's office. The sheet is ruled with horizontal lines that represent tonnage and with vertical lines that divide the year into days and months. On this sheet the results of each machine are recorded separately. Whether the tonnage on a particular day for a machine was produced during the day or the night shift, or during both, is indicated. Day-shift tonnage is entered in solid color and night-shift tonnage is cross-hatched.

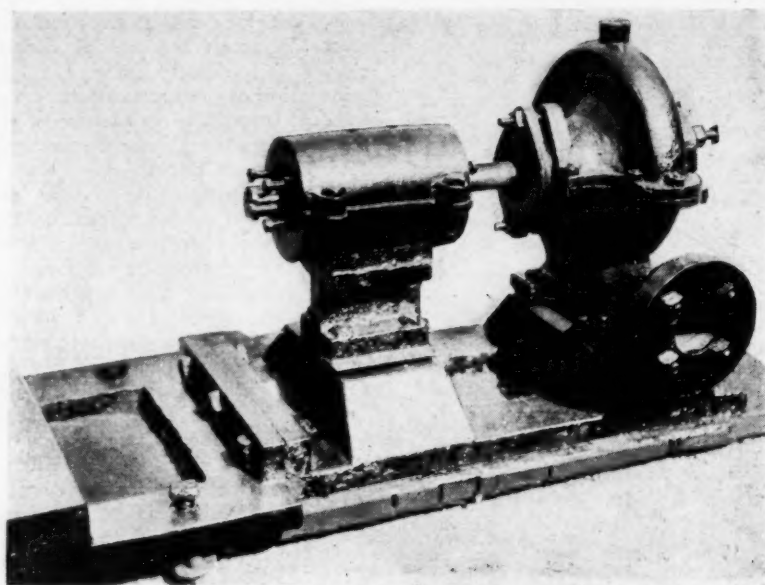
Pump Has Separate Bearing And Saw-Tooth Rotor

Acidulous water has caused the Davis Coal & Coke Co., Thomas, W. Va., to do considerable experimenting with small centrifugal pumps. Some they make out of maple and others they cast from acid-resisting bronze. A 2-in. bronze pump of 150 g.p.m. capacity at a 90-ft. head, with a speed of 1,200 r.p.m. is shown in the accompanying photograph.

There is no bearing attached to the pump casing proper. An extra long bearing of the marine thrust type in the pedestal supports the overhanging shaft which is of generous diameter for a pump of this size. The position of the

"Let's See—Yesterday That Machine Loaded 350 Tons," Says the Super





The Bearing Is on a Separate Pedestal

impeller is adjusted by four capscrews which butt against the lining in each end of the bearing. The impeller, of the saw-tooth type with openings through the web to reduce the thrust, is cast integral with the sleeve which protects the steel shaft from the water. This type of pump is used for intermediate service between gathering pumps and main pumps. The alloy used is composed of 75 per cent copper, 15 per cent lead, and 10 per cent tin.

Coupling-Pin Retainer Prevents Runaway Trips

If a mine-car coupling pin works loose from the clevis on a heavy grade, on a slope or incline, the result will be destructive to property if not disastrous to life. Commenting on this danger, J. P. Waters, technical publicity department, Union Carbide Co., suggests the following procedure as a solution:

Can Be Lifted Only When Slot and Finger Are in Line



One large company has adopted a simple locking device which it has applied to the couplings of over 2,000 mine cars. Using an oxyacetylene blow-pipe, a small finger of steel is welded to the top half of the clevis. This finger just passes through the keyway cut in the shoulder of the pin. After the pin is dropped into position, it is given a half turn and cannot be lifted again unless turned back to the original position. The possibility that the hook and the keyway will exactly match while the cars are coupled is extremely remote. Especially is this true with pins that have a ring at the end, as the ring prevents the pin from turning. The two small fingers in the foreground of the accompanying illustration show the shape and size that should be used.

Truck Serves as Hoist In Shaft Sinking

When shallow shafts are sunk by the coal company, the problem is faced of providing appropriate hoisting equipment without incurring large expense for a job which is undertaken at rare intervals. William Strain, general manager, Strain Coal Co., Renton, Wash., found a solution in sinking a 100-ft. shaft by improvising the tractive power of a 5-ton automotive truck for hoisting a mucking bucket. No electric or steam power, incidentally, was available where the shaft was sunk.

The general arrangement of equipment in the scheme used is shown in the accompanying illustration. Not only did the truck serve as a hoist substitute but it also handled the material



The Truck Served Both to Lift and Haul Muck From the Shaft

on the surface and provided ample material storage for several hours' run. The roadway was extended as the shaft deepened.

When the coal was reached, considerable development was done in the seam using this same equipment. As much as 15 tons of coal a shift was hoisted and trucked to the tippie while a slope was being sunk.

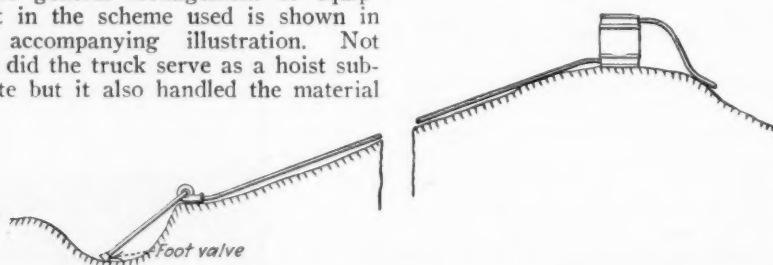
A rather small bucket was used, holding only about 400 lb., but, in low gear, the truck could hoist a much larger quantity. Control was almost perfect through the gear range and clutch. The bucket could be hoisted through the trap door on top, lowered about a foot, and tilted without putting the truck in reverse. This was accomplished by simply inclining the last few feet of the truck's run so that it would roll back slightly after the bucket had reached the maximum height.

Leak Counteracted by Barrel In Pump Discharge

In mines of the Davis Coal & Coke Co., Thomas, W. Va., 50-gal. wood barrels are connected in the discharge lines from intermediate centrifugal pumps near points of highest elevation. This arrangement, in combination with a foot valve on the suction, ordinarily insures that there will always be water in the line for priming.

With a discharge line having no leaks and a foot valve that is perfectly tight, the line should stay full of water; but very often a foot valve will leak slowly. The storage of 50 gal. usually takes care of this leak beyond the time when the pump is started again.

Schematic Drawing of Priming Arrangement



WORD from the FIELD



Lake Cargo Hearings Held

Hearings in the lake cargo coal rate case were resumed in Chicago, Oct. 6, before Examiner C. M. Bardwell of the Interstate Commerce Commission. The first day was taken up by a continuation of the testimony of representatives of the western Pennsylvania and Ohio operators, the complainants in the case (*Coal Age*, July, 1930, p. 447). Exhibits showing the relation between movements from the northern and southern fields, rates, distances, etc., were introduced. On Oct. 7, G. N. Snider, representing the Anthracite Institute, took the stand to show that hard-coal producers would be injured by the reduction in rates asked by the complainants without a similar reduction in anthracite rates.

Southern carriers were unanimous in asking that no change be made in the existing rates. They contended that shipments by the northern operators were increasing, and that the number of mines on their lines, as well as the tonnage moved, were decreasing. Mining and other interests in West Virginia, Virginia, and Kentucky supported the railroads' contentions, and introduced evidence purporting to show that adverse conditions were responsible for the plight of the northern operators, and not the freight differential.

Representatives of consumers in the Northwest appeared against any increase in rates, arguing that such a move would result in the substantial substitution of other fuels. Examiner Bardwell adjourned the hearing on Oct. 16 to Nov. 12, at Washington, D. C., where the Northwestern consumers will complete their direct testimony, and the complainants will present their rebuttal.

Colorado Association Formed

Thirty-five coal operators from the five Western Slope counties of Colorado formed the Western Colorado Coal Operators' Association at a meeting in Delta, Colo., Oct. 15. The counties represented in the new association are: Gunnison, Montrose, Delta, Mesa, and Garfield. At the organization meeting it was voted to adopt a code of fair trade practices, similar to that of the Colorado and New Mexico Coal Operators' Association. Officers of the group are: President, J. S. Bowie,

Business Tide Slackens

"As we near the end of October, when activity usually is at its fall peak, it becomes clearer that business this year has failed to respond in full measure even to the usual seasonal expectations," says *The Business Week* of Nov. 5. "This is more clearly evident in primary production and distribution than in general trade, which still appears to be moving up to its holiday high point. Our preliminary index for the week ended Oct. 25 fell still further, from 84.3 per cent to 83.2 per cent of normal, a new low level in the current recession, reflecting relative slackening in steel, coal, and electric power production, merchandise car loadings, and building contracting.

"The sustained strength of residential building, especially in the New York metropolitan area, relative improvement in railroad earnings, steady reduction in stocks of staple cotton and wool textiles and lumber, continued stability of commodity prices, are moderately bullish portents of recuperation. There is a bare possibility that November and December will make a better than seasonal showing or at least more favorable comparisons with last year than heretofore. But it is clear that business is again disposed, as in July and August, to throw away another two months of this year and to wait for the buds and birdies of spring, which the sublime laws of nature invariably supply on schedule. With production cut to 50 per cent of capacity for two months more, and consumption running on, as it is, not far below normal, human nature may yet give these resigned Brahmins of business a swift and surprising kick in the pants after the turn of the year."

Bowie, Colo., Juanita Coal & Coke Co.; vice-president, Edward Hill, Paonia Coal Co., Paonia, Colo.; secretary-treasurer, Thomas Allen, Midwest Development Co., Grand Junction, Colo.

New Plant Construction

New contracts for topworks and construction under way or completed at various coal operations reported for the month of October are as follows:

CLAYTON COAL Co., Erie, Colo.; construction nearly completed on a steel tippie for a new mine. Equipment will consist of shaker screens, loading booms, domestic loading machinery, and box-car loader, to prepare and load lump, egg, nut, pea, slack, and mine-run coal; capacity, 2,000 tons per day.

JAMISON COAL & COKE Co., Hannastown, Pa.; contract closed with the Fairmont Mining Machinery Co. for a complete Peale-Davis preparation plant; capacity, 300-350 tons per hour of 5x0-in. coal. The structure will be of steel, and crushing facilities have been provided for in the plans. A feature of the plant will be the inclusion of facilities for loading both low- and high-sulphur coals; to be completed in April, 1931.

MACALPIN COAL Co., McAlpin, W. Va.; contract closed with the American Coal Cleaning Corporation for tube-type dust-collecting system; capacity, 63,000 cu.ft. of air per minute.

UTAH FUEL Co., Clear Creek, Utah; new tippie equipped with shaker screens and loading booms completed; capacity, 1,500 tons per day. A feature of the design is a rescreening plant to treat minus 3-in. coal on high-speed shakers.

Gas Line Permit Asked

A permit for the construction of a natural gas line from the gas fields of Kentucky to Detroit, Mich., has been filed with the Detroit council by the Northern Industrial Gas Co. If the permit is granted, work on a 22-in. line, to cost \$25,000,000 and supply a minimum of 150,000,000 cu.ft. per day, will be rushed to completion by June, 1931. A considerable number of Detroit industries, it is claimed, have already let contracts for gas supplies.

Four applications of the Manufacturers' Light & Heat Co., a subsidiary of the Columbia Gas & Electric Corporation, to construct gas pipe lines through four streams in Chester County, Pa., have been approved by the Pennsylvania Water and Power Resources Board.

The streams are: Octoraro Creek, near Pinegroves; Brandywine Creek, near Mortonville; Buck Run, in East Fallowfield township; and Doe Run, in Rosewick.

The Illinois Commerce Commission, on Oct. 21, took under advisement the application of the Panhandle-Illinois Pipe Line Co. for a certificate of convenience and necessity to operate a natural gas pipe line in Illinois. No evidence was presented in behalf of the coal-mining or farming interests of the state during the hearings on the application.

Public investment in new natural gas securities in the last seven years is estimated at \$450,000,000 in a survey made by G. E. Barret & Co., New York City, while private financing by individual corporations is believed to have brought the total up to \$750,000,000. In 1929 and to date in 1930, natural gas projects involving almost \$200,000,000 have been financed by large oil companies and electric utilities, aside from public participation. Natural gas now represents an investment of \$2,250,000,000, it is estimated.

Federal control of natural gas lines is advocated by Senator Capper, Kansas, who has announced that he will introduce a bill in the next session of Congress giving the Interstate Commerce Commission jurisdiction over natural gas lines, their rates, services, valuation, earnings, and financing. In an interview, the Senator said: "There is at present no controlling hand to halt the abuses by gas pipe lines in their interstate trade. They decline to recognize the authority of any state to fix their rates or in any way control their operations. Certainly such an industry rendering such a vital service to thousands of homes and preparing to serve many more should be under some restraint. I believe there is sound basis for the contention that there should be some form of control over pipe lines."

Sunday Creek Blast Kills 79; Tytus Dies in Mine

An explosion in the No. 6 mine of the Sunday Creek Coal Co., Millfield, Ohio, in the afternoon of Nov. 6, killed 79 men. Twenty others were gassed, some of whom may die. More than 100 others escaped uninjured. Among the dead were W. E. Tytus, Columbus, Ohio, president of the company; P. A. Coen, Columbus, vice-president in charge of sales; Howard Upson, Newark, field manager; H. E. Lancaster, Athens, chief engineer; Walter Hayden, Athens, mine superintendent; Joseph Bergen, Zanesville, superintendent, Ohio Power Co.; and Robert Parsons, superintendent; Thomas B. Traynor, traffic manager; and Vernon Roberts, foreman, Pittsburgh Plate Glass Co., Fultonham, Ohio.

When the blast occurred the miners working near the shaft were hoisted to the surface unharmed. The other twenty men who were rescued alive



W. E. Tytus

barricaded themselves off in a portion of the workings and were brought out suffering from carbon-monoxide poisoning. The bodies of Mr. Tytus and the others of his party were found huddled together near the airshaft at the back of the mine. Most of the men in the mine died from carbon-monoxide poisoning, though some of the bodies showed evidence of violence. Cause of the blast was not determined.

Thompson Company Formed

The Thompson Coal Mining Co. was organized at a meeting in Bridgeport, Ohio, late last month, to take over the Central Coal Mining Co. Holdings of the latter company which will go under the control of the Thompson company include 800 acres of unmined coal in Belmont County, Ohio, together with the mine and surface plant. Charles T. Gallaher, Moundsville, W. Va., was elected president of the new company.

Hazard to Build Gas Plant

An anthracite gas producer, the first in the section, will be erected by the Hazard Wire Rope Co., Wilkes-Barre, Pa., to supply gas to its plant. Cost of the producer is estimated at \$27,000. Anthracite will be used to manufacture the several millions of cubic feet of gas used by the Hazard company each month, which is now purchased from the Pennsylvania Power & Light Co.

Draper Eagle Sale Confirmed

Sale of the Draper Eagle Coal Co., operating at Logan, W. Va., to Joseph Spigel, Roanoke, Va., has been confirmed. Mr. Spigel acquired the property by paying the 1928, 1929, and 1930 taxes, and the costs of bankruptcy. The mine was closed early in 1929, when the company was adjudged a bankrupt. Preparations for resumption of operation are under way.

P.&R. Sells Power Companies

The Philadelphia & Reading Coal & Iron Co., Philadelphia, Pa., on Oct. 21, announced that it had sold its electric generating plants at Locust Gap and Good Spring, Pa., to the Pennsylvania Power & Light Co. Included in the deal were the transmission and distribution lines, rights of way, and other power facilities of the coal company in Northumberland, Columbia, and Schuylkill counties, and a power site at Hearndon, Pa. The agreements, it was stated, included a contract for reciprocal purchases of coal and power.

Y. & O. Mine Reopens

The Enterprise mine of the Youghiogeny & Ohio Coal Co., Washington, Pa., will be reopened Nov. 10, after a shutdown of seven weeks. Two hundred men will be given employment at the operation, which normally produces 1,500 tons per day.

Ask Coal and Railroad Meeting

As a result of a meeting of coal producers in Louisville, Ky., Oct. 2, to consider natural gas competition, traffic vice-presidents of all the railroads serving the coal fields in eastern and western Kentucky, eastern Tennessee, Alabama, and Virginia have been asked to meet with representatives of the operators at an early date for further discussion of co-operative effort to combat the inroads of natural gas in the coal markets of the region.

Celebrates Anniversary

The American Cast Iron Pipe Co., Birmingham, Ala., in the month of October celebrated the twenty-fifth anniversary of its founding. The company was incorporated in Georgia, Oct. 9, 1905, with the late John J. Eagan, Atlanta, as president. During the week of May 11, 1906, the first cast was taken off, and the first shipment of pipe went to Atlanta on May 19. Annual sales are now valued at \$7,000,000, and the annual payroll is \$2,000,000. The company was the first to manufacture cast-iron pressure pipe in 16-ft. lengths.

Employee relations have been one of the features of the growth of the company. Bath houses and lockers were installed in 1912, and in 1913 a modern restaurant and Y. M. C. A. building were built, followed by a complete medical dispensary for the care and treatment of employees and dependents. In 1917, the pension fund was inaugurated, and in 1922, the first profit-sharing arrangement was established. Since then, unemployment wages and vacations with pay for day workers have been adopted. In January, 1929, group life insurance covering all employees was purchased. The expense of all these activities is borne by the company under the John J. Eagan co-operative plan.

A.F.L. Refuses Insurgent Peace Proposal; General Strike Hinted in Illinois

THE olive branch proffered by John H. Walker, Springfield, Ill., secretary of the insurgent mine workers, was refused by the American Federation of Labor last month. Mr. Walker, on Oct. 7, addressed a letter to William Green, president of the federation, which was then in session in Boston, Mass., in which he suggested that a convention of miners be called by Mr. Green, to include leaders of the regular and insurgent factions and of active locals, for the discussion of peace measures.

The executive council of the federation, however, at a meeting on Oct. 12, turned the proposal down, and the next day President Green wrote Mr. Walker saying that seceding groups could not secure affiliation with the federation except by an agreement with the officers representing the union from which the withdrawal was made. Mr. Walker replied on Oct. 23 that both his and the Lewis group claimed to be the United Mine Workers and requested that, until the question was settled by the courts, both groups be accorded recognition by the American Federation of Labor.

As a result of the dissension in the ranks of the Illinois miners, operation of mines in the state have seriously been interfered with in violation of the working agreement, said Joseph D. Zook, president, Illinois Coal Operators' Labor Association, Chicago, in a letter on employment in the coal industry sent to George F. Getz, chairman of the Governor's Unemployment and Relief Commission, on Oct. 29. "During the last twelve months," Mr. Zook wrote, "without cause on the part of the operators, 49 strikes in the coal fields have been reported, which have involved more than 21,000 men, who lost in wages a sum estimated at \$1,622,000. Several strikes are still in effect, and threats are being made of a still more serious interruption commencing Nov. 15."

Referring to the installation of mechanical loaders, which is permitted by the agreement as a means of recovering Illinois markets and developing new ones, Mr. Zook declared that the association placed itself "squarely upon record that production by mechanical methods is the only way" by which the competition of other fields and substitute fuels can be met, despite the fact that "the adjustment made necessary by the installation of mechanical equipment has been designated as one of the contributing reasons for some of the distress in the coal fields."

Despite the defection of five of the smaller companies in the western Kentucky strike area, operators last month persisted in their refusal to recognize the United Mine Workers. As a result, the strike infection continued to spread, though it was not accompanied by as

much violence as that evidenced in previous walkouts. The five companies which signed up with District 23 of the Lewis faction on Oct. 9 were: Black Diamond Coal Mining Co., Drakesboro; McDonald Coal Mining Co., Midland; West Virginia Coal Mining Co. and National Coal & Coke Co., Island; and the Wilcut & Napier Coal Co., Cleaton. All the operations are in Muhlenberg and McLean counties.

The agreement calls for the payment of the present wage scale and for the calling of a conference within 30 days for the negotiation of a new scale. The agreement further provides that the coal companies deposit in escrow sufficient funds to pay the difference to the miners in case that the negotiations result in the adoption of a wage scale equal to the 1917 scale or higher than the prevailing rate. The 1929 production of the five companies was stated to be 742,857 tons, with a daily rating of 91 cars. In western Kentucky as a whole, at the middle of October, it was estimated that 65 per cent of the mines, representing 50 per cent of the production, were shut down as a result of labor troubles.

Five men were sentenced to the

federal penitentiary at Atlanta for participating in the airplane bombing of mines in western Kentucky on Aug. 11. Judge Charles I. Dawson, Louisville, Ky., passed the sentences on Nov. 5. Essel Grant, Ewing Riley, and Noble Harris, Providence, Ky., each received eighteen months for violating federal laws relating to air commerce, and an additional year and a day for offenses against an injunction restraining them from interfering with the operation of mines in the territory. Paul Montgomery, Murphysboro, Ill., pilot of the plane, received a year and a day for the bombing, and Edward Heckelbeck, Zeigler, Ill., will serve the same sentence for conspiring to bring the pilot and the miners together. Charges against seven other miners from both Kentucky and Illinois were dismissed by agreement.

In the Kanawha field of West Virginia, the peace following the signing of an agreement between the Kellys Creek Colliery Co. and its striking employees at Ward, W. Va., was of short duration. The pact was signed on Oct. 6, and on the next day representatives of the insurgent faction of the United Mine Workers succeeded in calling out the men again. At the end of the month, the strike, under the direction of Frank Keeney, was in full swing, and the insurgents were confident that it would prove the entering wedge for the group in southern West Virginia.



Traffic Counsellors Elect

Adoption of a code of ethics was the principal feature of the first annual meeting of the Association of Practitioners before the Interstate Commerce Commission, held at Washington, D. C., Oct. 30-31. Traffic managers and attorneys to the number of 400 attended. Officers elected for the coming year were: president—John J. Esch, former member of the Interstate Commerce Commission; vice-president, Eastern district—W. H. Day, manager, transportation bureau, Boston Chamber of Commerce; vice-president, Southern district—T. J. Burke, commissioner, Charleston (S. C.) Traffic Bureau; vice-president, Western district—S. J. Wettrick, traffic manager, Seattle Chamber of Commerce; chairman, executive committee—Kenneth F. Burgess, general solicitor, Burlington R.R.; secretary—John D. Battle, traffic manager, National Coal Association; treasurer—Karl Knox Gardner, attorney, Washington, D. C.



Power Show to Be Held

Over 400 exhibitors have taken space at the Ninth National Exposition of Power and Mechanical Engineering, to be held Dec. 1-16, in the Grand Central Palace, New York City. Pulverized coal equipment and stokers will be in the majority among the new devices to be exhibited.

16,747 Ask Federal Aid For Coal Industry

With the addition early in October of petitions from central Pennsylvania containing several hundred names to the growing pile of similar documents in the office of the Secretary of Labor, the number of persons requesting federal aid for the bituminous coal industry now totals 16,747. Included in the group are business and professional men, miners, and wives and mothers of miners from the states of Pennsylvania, West Virginia, Maryland, Ohio, and Kentucky. These petitions were circulated by the United Mine Workers.

Officials of the United Mine Workers have advised Secretary Davis that if he will call the long-sought conference of mine workers, operators, and government officials, they will submit to him a list of operators and bankers who have signified their willingness to attend. However, the Secretary has not receded from his previous refusal to call such a meeting. Of the 16,747 signatures on the various petitions, only eleven indicate that they are operators of coal mines, and of these, only two are given in coal catalogs of recent issue.

St. Louis Institute Formed

To offset the campaigns of oil and natural gas interests in the St. Louis (Mo.) area, coal dealers and heating-equipment manufacturers have organized the Coal Institute of St. Louis. The organization, which is affiliated with the St. Louis Coal Bureau, Coal Merchants' Educational Bureau, and St. Louis Coal Club, will concentrate its efforts on the smokeless combustion of soft coal, and will furnish combustion engineering and information service to the industry. A part of its activities will be the instruction of coal salesmen in the principles of coal-burning.

As an initial step in its program, the institute opened a stoker exhibit on Sept. 30, which was visited by 150 people on the opening day, including both consumers and members of the industries affiliated with the institute. Four of a series of ten weekly meetings for the discussion of salesmanship and combustion, which started on Oct. 22, have already been held. Attendance at each of the sessions was between 90 and 100 persons, including wholesale and retail coal salesmen, engineers, furnace men, stoker men, and others interested in the coal and heating-equipment industries.

Bar Committee Appointed

Members of the committee of nine of the mineral section of the American Bar Association have been appointed for the year 1931. The committee, which is to study the advisability of proposed mineral legislation and is to co-operate with existing agencies, will be composed of the following: Walter F. Dodd (chairman), Chicago; James A. Veasey, Tulsa, Okla.; J. Bruce Kremer, Butte, Mont.; Edgar L. Greever, Tazewell, Va.; T. L. Foster, Dallas, Texas; Earle W. Evans, Wichita, Kan.; John T. Barnett, Denver, Colo.; Hiram M. Dow, Roswell, N. M.; and A. V. Andrew, Los Angeles, Calif.

Budget Control Advocated

Use of budgets as an aid to management in controlling overhead, production, and purchases, was urged by E. S. La Rose, assistant comptroller, Bausch & Lomb, in an address before the New York chapter of the National Association of Cost Accountants, Oct. 14. Rapidly changing business conditions of today, said Mr. La Rose, make scientific forecasting more important than ever, not only to the individual concern but to business in general.

"Many large and small industries believe they are working on a budget," he observed, "when more often than not you will find that their sales budget is entirely distinct and divorced from the operations in the plant, and therefore unbalanced." The large losses being sustained by many organizations as a result of the suddenness with which the business depression descended could

have been minimized by budgetary control. Bausch & Lomb, he continued, used advertising pressure to maintain sales as close as possible to the forecast, and in that manner the rest of the organization was kept nearer to the schedule originally outlined.

Mining Congress to Meet

Coal-mining problems and election of officers will engage the attention of members attending the annual meeting of the American Mining Congress, to be held in Washington, D. C., Dec. 4-6. In place of the usual large convention, a series of group meetings have been arranged, as follows: Dec. 4, conference on coal-mine mechanization; Dec. 5, conference on stabilization of industry, election of officers; Dec. 6, conference on mineral taxation.

Trailing Cable Approved

As a result of field tests and laboratory investigation, the U. S. Bureau of Mines has decided to recommend rubber-sheathed cable passing certain tests as safest for use with permissible mining machines, though it will not extend formal approval to cover the cable in its present stage of development. Routine tests outlined by the Bureau are given in the following:

The cable shall be placed across two rails of a track and a 4-wheeled, 7-ton car will be run across it 50 times. Speed of the car shall be approximately 3½ miles per hour, and potential shall be applied to the cable during tests. The cable shall be shifted in position after each passage of the car, thus giving 100 places over which two wheels have passed. To warrant special recommendation of the Bureau, a cable must neither become short-circuited nor grounded, either to the rails or wheels, at more than 10 per cent of the 100 places.

No. 2 parallel duplex "Hazacord" cable, manufactured by the Hazard Insulated Wire Works, Wilkes-Barre, Pa., has passed the foregoing test, and will be included in the next annual list of permissible equipment as "No. BM-1 cable, especially recommended for use with permissible mining machines."

Requests Lower Rating On Cutter Bits

A plea for a reduction from third to fourth class in the rating of mining machine cutter bits in Official Classification territory was made at a hearing before the classification committee in New York, Oct. 15 by C. E. Holt, secretary, Leetonia Tool Co., Leetonia, Ohio. Mr. Holt pointed out that until recently these bits had been accorded the lower classification and argued that, on the basis of value, loading, and liability to damage in transit, the bits should have the lower rating restored.

Fire Traps Three Miners

Three miners were killed by carbon monoxide fumes which followed a fire at the Dalton Coal Co. mine, near Massillon, Ohio, Oct. 8. The blaze destroyed the surface plant at the mine and sealed the opening so that the three men in the mine could not escape. One rescue worker also was killed by carbon monoxide.

New River & Export Sold

Holdings of the New River & Export Coal Co., in Fayette County, W. Va., were sold last month for \$22,530. Properties at Lookout, W. Va., were purchased by agents of the John Nuttall estate, who, it is expected, will lease them in the near future. The Michigan mine of the New River company was sold to the Mountain View Realty Co. for \$5,030.

Oklahoma Blast Kills Thirty

Thirty men were killed in an explosion in the Wheatly No. 4 mine of the Samples Coal Co., McAlester, Okla., on the night of Oct. 30. Rescue work was hampered by falls of roof and after-damp, but all the bodies were recovered by the following morning. Cause of the blast has not yet been determined.

Bureau of Mines Approves Explosives

Two additions to the active list of permissible explosives were made by the U. S. Bureau of Mines in September. Details for both explosives are given in the accompanying table. In addition, the bureau granted Extension No. 3 to Approval 2, cover-

ing the permissible blasting device, Cardox, Model "G." The extension covers a heater mixture weighing 160 grams and containing as the characteristic ingredient potassium perchlorate for use with disks 6.4 and 7.9 millimeters thick.

Changes in the Active List of Permissible Explosives During September*

	Volume Poisonous Gases	Character- istic Ingredient	Weight of 1½-8-In. Cartridge, Grams	Smallest Permissible Diameter, Inches	Unit Deflective Charge, Grams	Rate of Detonation in 1½-In. Diameter Cartridge, Ft. per Sec.
¹ Genigel No. 1.....	A	6	224	1½	267	8,430
² Hercogel C.....	A	6	189	1	243	11,640

*Class designations are fully explained in *Coal Age*, July, 1930, p. 426. ¹General Explosives Co.; same as Coal-Gel. No. 1. ²Hercules Powder Co.

Illinois Mining Institute Will Foster Vocational Training and Research

THAT the Illinois Mining Institute assume the task of initiating proper plans for vocational training of men employed in and about Illinois coal mines, is the substance of a resolution adopted by that body at its fall meeting, held at Centralia, Ill., Oct. 31-Nov. 1. John A. Garcia, of Allen & Garcia Co., Chicago, was the proposer. Such action, it was said, would reflect the aims of the institute, which has for one of its objects the advancement of the mining industry by encouraging education in practical and scientific mining. It records a realization that the increasingly complex problems of the mining industry necessitate the services of men trained and skilled in the methods of modern mining and preparation of product. Training of talent along these lines would tend toward the advance of men so developed, and provide for more efficient and safer operation.

There is not now available in Illinois, as in other coal-mining states, adequate facilities for such training. The resolution has for its objectives, first, to assist those who have not had an opportunity to receive the benefits of higher education so that they may improve their prospects for advancement and, second, to provide coal companies with men better qualified to accept positions and responsibility as skilled workers.

At this meeting also the institute adopted a resolution that the University of Illinois and the State Geological Survey be urged to recognize the need for research to further the utilization of Illinois coal. A clause in this resolution urged that these agencies be provided with adequate buildings, equipment, and technical personnel as a means of rehabilitating the coal industry in the state, which, for many reasons, has diminished progressively in volume of business over the past decade. A. C. Callen, president, and B. E. Schonthal, secretary of the institute, offered this resolution.

M. M. Leighton, chief, Illinois Geological Survey, spoke strongly of the necessity for additional facilities in the mining school at Urbana, if undergraduates who are sincere in their desire to follow the mineral industries are not to be turned to other fields of engineering. J. D. Zook, president and commissioner, Illinois Coal Operators' Labor Association, reported that the president of the university had given assurance that every consideration would be extended toward increasing these facilities. Mr. Leighton felt that the mineral industry was discriminated against by the meager appropriation made for it. He added that while the mineral industry was second only to agriculture in the state, it received only about one-fifth the financial support.

Frank F. Tirre, special representative of the Better Business Bureau of St.

Louis, asked the institute to consider how the various Illinois coals could be classified to prevent misrepresentation and erroneous advertising. The state of Missouri, where much Illinois coal is sold, he said, requires that deliveries be correctly described as to quality, kind, and character. A committee was appointed to gather information and statistics on this matter for consideration at the coming summer meeting.

Following are the institute officers elected for the coming year: president, J. D. Zook; vice-president, George C. McFadden; secretary-treasurer, B. E. Schonthal. The incoming executive board is composed of A. C. Callen, John A. Garcia, Carl T. Hayden, J. A. Jeffers, W. J. Jenkins, J. E. Jones, John G. Millhouse, Harry Moses, Charles F. Hamilton, F. S. Pfahler, H. A. Treadwell, and Paul Weir.

Pennsylvania Blasts Kill Six

An explosion of gas in the No. 1 colliery of the Kingston Coal Co., Kingston, Pa., Oct. 10, killed four men of a crew engaged in extending gangways to develop new territory. On Oct. 30, an explosion in the Richards mine of the Susquehanna Collieries Co., Shamokin, Pa., killed two men who were working in a chute. The cause of the blast remains a mystery.

Percentage Depletion Advocated

Metal mine owners are actively advocating a proposed amendment to the Revenue Act of 1928 providing for a percentage depletion allowance of 33½ per cent of the taxpayer's net income in the case of mines. The amendment, as formulated by the metal interests, is not limited to metal mines alone but would apply to coal mines as well, and the industry is attempting to find out whether such a measure would be opposed or not by the coal industry before proposing it.

Metal mine owners do not propose to make percentage depletion the exclusive method of computing depletion, as shown by the wording of the amendment:

(2) *Percentage Depletion for Mines*—In the case of mines the allowance for depletion shall be 33½ per centum of the taxpayer's net income as defined in Sec. 21 (computed (a) without allowance for depletion, and (b) excluding such items of gross income and deductions as are not directly attributable to the operations of mineral or metal production from the property), except that in no case shall the depletion allowance be less than it would be if computed without reference to this paragraph.

The amendment would be substituted for the present section in the Revenue Law which permits mining companies under certain conditions to set up

"discovery value" as a basis, among other things, for computing depletion. The last two lines of the amendment operate to preserve the right to depletion on the basis of cost or March, 1913, value. For metal mining companies, the amendment would be, in effect, a substitute for depletion based on discovery value. For coal mining companies which have been unable to profit by setting up any discovery value, the amendment amounts to a new, permissible method of computing depletion.

Gas Coal Use Increases

Bituminous coal is the only solid fuel in increasing use in the manufacture of artificial gas, according to the 1930 "Annual Statistics of the Manufactured Gas Industry in the United States," issued by the American Gas Association. In 1926, 8,941,000 tons of soft coal were used for that purpose. In 1929, the consumption was 9,910,000 tons, a rate of increase of 10.8 per cent. In the same period, anthracite declined 55.7 per cent; coke and breeze, 3.6 per cent; and petroleum and fuel oil, 12 per cent. The quantity of gas produced in 1929 varied only 1 per cent from the output in 1926.

German Anthracite Imported

Burns Bros., New York City, have completed arrangements with the Hockelhovener Coal Co., said to be one of the largest producers of anthracite in Germany, for the exclusive sale of the latter's coal in the United States and Canada. The first cargo, consisting of 5,000 tons of pea coal, was discharged in New York City in the middle of October. Importation of German anthracite, it is said, will relieve Burns Bros. of the necessity of purchasing large sizes of anthracite to obtain the more popular small sizes for stoker use, with a consequent reduction in the company's inventory of larger sizes.

Anthracite Shipments Fall

Anthracite shipments in September, 1930, as reported to the Anthracite Bureau of Information, Philadelphia, Pa., were 3,899,405 gross tons, a decrease of 922,385 tons and 1,460,725 tons from the totals in the preceding month and in September, 1929, respectively. Shipments by originating carriers in September, 1930, as compared with the preceding month and with September, 1929, are as follows, in gross tons:

	Sept., 1930	August, 1930	Sept., 1929
Reading.....	788,762	932,584	952,132
Lehigh Valley.....	573,873	745,772	1,083,593
Central R.R. of N. J. . .	348,133	452,289	448,406
Del., Lack. & Western.....	544,879	722,329	771,915
Delaware & Hudson.....	651,901	669,419	739,198
Pennsylvania.....	417,828	506,320	443,792
Erie.....	367,801	489,939	515,499
N. Y., Ont. & West.....	86,237	86,128	121,928
Lehigh & New England.....	119,991	217,010	283,667
	3,899,405	4,821,790	5,360,130

Railroad Buying Investigated

Trading orders for traffic is an increasingly common practice on the part of railroads, according to testimony given in the Interstate Commerce Commission hearing on reciprocity in buying and routing, which opened before Director W. P. Bartell and Examiner J. L. Rogers, at Chicago, Sept. 30. Most of the railroad representatives who went on the stand favored giving "friends of the line" their supply orders as far as possible, "price, quality, and service" being comparable. Several examples showing that both the railroads and shippers used purchases and routings, respectively, as means of getting business went into the record. However, the railroad representatives were in accord in saying that the practice might possibly be carried beyond ethical limits.

During the hearing, representatives of the Chicago & North Western Railway; Monon Route; Atchison, Topeka & Santa Fe Railway; Chicago, Burlington & Quincy R.R.; Chicago Great Western R.R.; Chicago, Rock Island & Pacific Railway; Illinois Central R.R.; Chicago, Milwaukee, St. Paul & Pacific R.R.; and the Chicago & Alton R.R. were questioned. Purchases of draft gears, which originally brought reciprocal buying before the commission, played a major rôle in the hearing. Most of the witnesses asserted, however, that the solicitation of the Swift & Co., Armour & Co., the Grigsby-Grunow Co., and others for purchases of draft gears from companies in which members of the firms were interested were largely unheeded. Some few railroad men admitted purchases, but stated that the business return was, as a rule, unsatisfactory.

Ice, lumber, oil, and coal also entered into the hearing. Allocation of orders for coal to mines on the railroads' lines in proportion to the tonnage shipped over the road seems to be the common practice, according to most of the replies on reciprocity in the purchase and routing of coal. Prices paid by the railroads for their fuel coal were stressed by the attorney for the commission. Most of the railroad men asserted that the price was determined after consideration of the prevailing market conditions and production costs, with an allowance for profit for the producers. Most of the coal is bought by direct negotiation with the operators, but whenever purchases from other sources are made, the prevailing price, determined as above, is paid by the railroads, witnesses stated.

Track Committee Named

Organization of a technical committee to revise the American tentative standards for mine tracks, signals, and switches has been announced by the American Standards Association. The committee will include the following coal men and Bureau of Mines representatives: Heber Denman, Paris, Ark., Paris Purity Coal Co.; R. L. Ireland, Jr., Cleveland, Ohio, Wheeling

& Lake Erie Coal Mining Co.; C. E. Watts, Windber, Pa., Berwind-White Coal Mining Co.; C. K. Witmer, Irwin, Pa., Westmoreland Coal Co.; Rush N. Hosler, Harrisburg, Pa., Pennsylvania Corporation Rating and Inspection Bureau; Thomas Mather, Tyrone, Pa., mine inspector; H. P. Finley Jellico, Tenn., Proctor Coal Co.; J. J. Lincoln, Elkhorn, W. Va., Upland Coal & Coke Co.; R. D. Tonkin, Leckrone, Pa., H. C. Frick Coke Co.; and L. C. Illsley, Pittsburgh, Pa., and Rudolph Kudlich, Washington, D. C., U. S. Bureau of Mines.

Earnings and Employment Decrease in August

Employment in coal mining—anthracite and bituminous combined—decreased 3.2 per cent in August, as compared with July, and payroll totals declined 0.6 per cent, according to the monthly *Labor Review* of the U. S. Department of Labor. The 1,368 mines reporting had in August 280,273 employees, whose combined earnings in one week were \$6,574,071. In anthracite mining in August there was a decrease in employment of 12.5 per cent, compared with July, and a decrease of 6.2 per cent in payroll totals. Employment in August, 1930, was 12 per cent lower than in August, 1929, while payroll totals were 0.5 per cent higher.

Employment in bituminous mining increased 1.4 per cent in August as compared to July, and payroll totals increased 3.2 per cent, according to reports from 1,215 mines, in which there were in August 197,580 employees, whose combined earnings in one week were \$4,041,274. Employment in August, 1930, was 6.8 per cent lower than in August, 1929, and payroll totals were 23.4 per cent smaller.

Employment and Payrolls in Identical Bituminous Coal Mines in July and August, 1930

	Mines	Number on Payroll			Payroll in One Week		
		July, 1930	August, 1930	Per Cent Change	July, 1930	August, 1930	Per Cent Change
Middle Atlantic.....	372	56,124	59,454	+0.6	\$1,236,106	\$1,259,847	+1.9
East North Central.....	152	25,612	26,045	+1.7	480,303	533,284	+11.0
West North Central.....	49	4,115	4,182	+1.6	76,308	78,183	+2.3
South Atlantic.....	315	52,773	53,089	+0.6	1,055,008	1,080,360	+2.4
East South Central.....	190	38,113	38,984	+2.3	685,689	696,947	+1.6
West South Central.....	28	2,096	2,163	+3.2	42,286	43,245	+2.3
Mountain.....	102	11,746	12,319	+4.9	299,420	315,736	+5.4
Pacific.....	7	1,347	1,344	-0.2	38,987	33,672	-13.6
All divisions.....	1,215	194,926	197,580	+1.4	\$3,914,197	\$4,041,274	+3.2

Per Cent Change in Each Line of Employment, July and August, 1930

Establishments	July, 1930	Employment		Per Cent Change	July, 1930	Payroll in One Week		Per Cent Change
		July, 1930	August, 1930			July, 1930	August, 1930	
Manufacturing.....	13,520	3,103,114	3,034,259	-2.1 ¹	\$76,837,119	\$74,168,247	-2.6 ¹	
Coal mining.....	1,368	289,447	280,273	-3.2	6,613,621	6,574,071	-0.6	
Anthracite.....	153	94,521	82,693	-12.5	2,699,424	2,532,797	-6.2	
Bituminous.....	1,215	194,926	197,580	+1.4	3,014,197	4,041,274	+3.2	
Metallic mining.....	335	51,616	50,619	-1.9	1,387,620	1,370,686	-1.2	
Quarrying and non-metallic mining.....	731	36,865	36,589	-0.7	932,434	936,626	+0.4	
Crude petroleum production.....	540	26,217	25,600	-2.4	920,829	895,304	-2.8	
Public utilities.....	11,277	757,502	750,691	-0.9	22,974,452	22,390,197	-2.5	
Trade.....	9,010	295,109	285,604	-3.2	7,619,169	7,316,580	-4.0	
Wholesale.....	1,967	61,877	61,273	-1.0	1,949,335	1,900,150	-2.5	
Retail.....	7,043	233,232	224,411	-3.8	5,669,834	5,416,430	-4.5	
Hotels.....	2,132	162,755	163,122	+0.2	2,741,334 ²	2,709,469 ²	-1.2	
Canning and preserving.....	915	64,731	95,131	+47.0	1,060,575	1,618,032	+52.6	
Total.....	39,828	4,787,356	4,721,968	-1.4	\$121,087,153	\$117,979,212	-2.6	

¹Weighted per cent of change for the combined 54 manufacturing industries; remaining per cent of change, including total, are unweighted. ²Cash payments only.

Personal Notes

R. R. KIRKPATRICK, general superintendent, Blue Blaze Coal Co., Consumers, Utah, has been made superintendent of the Standard Coal Co. mine at Standardville, Utah. S. C. HARVEY, whom Mr. Kirkpatrick succeeds, resigned to accept a position as superintendent for the Sevier Valley Coal Co., Crystal, Utah.

WILLIAM NISBET, Greensburg, Pa., for 40 years connected with the Keystone Coal & Coke Co., has retired. For the past 22 years, Mr. Nisbet was in charge of mine safety work, and his retirement terminates a connection with the coal industry extending back 67 years.

ERSKINE RAMSAY, Birmingham, Ala., chairman of the board, Alabama By-Products Corporation, has been appointed by Secretary Lyman Wilbur to represent Alabama on a committee of business men and educators who will make a national survey of secondary education.

EDGAR W. TAIT, Pittsburgh, Pa., formerly president, Allegheny River Mining Co., has organized the Stoneboro Coal Co., of which he is president. Mines of the company are in Mercer County, Pennsylvania.

ALBERT B. STEFFENS, Chicago, has been elected president of the Indiana & Illinois Coal Corporation, vice the late Theodore C. Keller, with whom he was associated for 25 years.

HUGH McLEOD, Rock Springs, Wyo., for the past three years supervisor of ventilation for the Union Pacific Coal Co., has been made assistant superintendent of the Rock Springs mines of the company. R. R. KNILL, Rock Springs, whose former position was that of foreman of mechanical loading, No. 8 mine, succeeds Mr. McLeod.

Attitude of Tax Board Still Undefined

Recision of a ruling of the Board of Tax Appeals in the West Virginia-Pittsburgh Coal Co. case, in which deductions for the cost of coal mine equipment in accordance with the precedent set in the Marsh Fork Coal Co. case were allowed, leaves the attitude of the Board in doubt. In an effort to determine the attitude of the Board toward the question of charging purchases of mine equipment to expense when the equipment serves only to maintain production, the National Coal Association learned last month that officials of the Bureau of Internal Revenue are not yet convinced that the favorable decisions in the Marsh Fork and Roden Coal Co. cases correctly interpret the law.

Before accepting the theory of these decisions it is the desire of the general counsel to obtain in a different circuit an opinion in at least one other case. Such a case is now pending before the U. S. Circuit Court of Appeals for the Sixth Circuit in the Brier Hill Collieries Co. case. In the West Virginia-Pittsburgh case, decided in favor of the taxpayer on Oct. 7, it was hoped that the Board would overrule its decision in the Union Collieries Co. case and others and accept the Marsh Fork ruling as of general application, but the wording of the decision seems to cover only cases in the Fourth Circuit, including Maryland, Virginia, West Virginia, North Carolina, and South Carolina. Under the Roden decision, the same rule probably would apply in the Fifth Circuit, covering Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas.

The effect of the Board's action in the West Virginia-Pittsburgh case is to leave it undecided. In the decision the Board stated that it was following the precedent established in the Marsh Fork case, concluding that an appeal would lie

in the Fourth Circuit. However, while the mines of the company are in West Virginia, a part of the Fourth Circuit, the tax returns were filed from the Cleveland (Ohio) office. An appeal from the decision of the Board would therefore be taken to the Sixth Circuit Court. Knowledge of this misunderstanding probably moved the Board to withdraw its order in the West Virginia-Pittsburgh case.

W. Va. Institute to Meet

Coal mining, preparation, mine ventilation, and mine management are the subjects scheduled for discussion at the 1930 meeting of the West Virginia Coal Mining Institute, to be held at the Prichard Hotel, Huntington, W. Va., Dec. 2-3. L. C. Campbell, Pittsburgh, Pa., general superintendent, Koppers Coal Co.; Ellsworth Shriver, Nellis, W. Va., general superintendent, American Rolling Mill Co.; R. M. Lambie, Charleston, W. Va., chief, West Virginia Department of Mines; and J. H. Edwards, Huntington, W. Va., associate editor, *Coal Age*, will address the meeting.

Coming Meetings

Indiana Coal Operators' Association; annual meeting, Nov. 18, Terre Haute House, Terre Haute, Ind.

Southern Appalachian Coal Operators' Association; annual meeting, Nov. 20, Knoxville, Tenn.

Operators' Association of Williamson Field; annual meeting, Nov. 25, Williamson, W. Va.

West Virginia Coal Mining Institute; annual meeting, Dec. 2 and 3 at Huntington, W. Va.

American Mining Congress; annual meeting, Dec. 4-6, at Washington, D. C.

Coal Mining Institute of America; annual meeting, Dec. 10-12, at Pittsburgh, Pa.

Obituary

EDWARD B. NEEDHAM, 71, secretary-treasurer, Cabin Creek Consolidated Coal Co., died at his home in Dayton, Ohio, Oct. 5, following a stroke of paralysis. Mr. Needham had been connected with the Cabin Creek company for 25 years.

JOHN REESE JAMES, Deputy Secretary of Mines of Pennsylvania, in charge of the anthracite division, died at his home in Scranton, Pa., Oct. 10, after a long illness. Mr. James, who was 59 years old, was for many years employed in the coal-mining department of the Delaware, Lackawanna & Western R.R., and later held a position with the Glen Alden Coal Co. He accepted the state appointment in 1927.

WILLIAM E. WATKINS, superintendent, Archbald colliery, Glen Alden Coal Co., died at his home in Scranton, Pa., Oct. 22. Mr. Watkins had been affiliated with the coal industry for over 50 years at the time of his death.

LOUIS C. MADEIRA, who, until his retirement several years ago, was secretary of Madeira, Hill & Co., died at his home in Germantown, Pa., Oct. 31, after a brief illness. Mr. Madeira, who was 77, was graduated from the University of Pennsylvania in 1872, and was employed for five years as a civil engineer for the Wilmington & Northern R.R. and the Bound Brook R.R. He then became interested in the insurance business, and later associated himself with Madeira, Hill & Co., as secretary.

DR. HERBERT H. DOW, president, Dow Chemical Co., Midland, Mich., died suddenly at his home on Oct. 15. Mr. Dow generally was recognized as one of the foremost chemists in the country, and recently was nominated for the Chemical Markets medal by Henry Ford.

King Coal's Calendar for October

Oct. 1—Fourteen miners are killed in an explosion in the Grove colliery at Brown Hills, near Walsall, Staffordshire, England.

Oct. 6—Miners in France go on a 24-hour strike as a protest against failure to obtain two weeks' annual holiday with pay for all underground workers and an additional pension allowance.

Oct. 6—President Hoover, in discussing the situation in the bituminous coal industry before the convention of the American Federation of Labor, in Boston, Mass., says that if the regulatory laws fail to halt destructive competition, "they should be revised."

Oct. 7—John H. Walker, secretary, insurgent United Mine Workers, sends to William Green, president, American Federation of Labor, a proposal to call a convention of leaders of both groups of the miners' union to consider peace measures.

Oct. 8—Three men die from inhaling carbon monoxide after being trapped in the Dalton Coal Co. mine, near Massil-

lon, Ohio, by a fire which destroyed the surface plant. One rescuer also lost his life.

Oct. 9—Five coal companies in the western Kentucky strike area sign wage agreements with District 23, United Mine Workers, calling for payment of the prevailing wage scale and the setting aside of funds in escrow for the workers in case that a new wage scale, to be negotiated within 30 days is higher than the present scale.

Oct. 10—Four men are killed by an explosion of gas in the No. 1 colliery of the Kingston Coal Co., Kingston, Pa.

Oct. 12—Executive council of the American Federation of Labor turns down the proposal of John H. Walker, secretary of the insurgent United Mine Workers' faction, for reconciliation of the two warring groups.

Oct. 17—Operators in Gunnison, Montrose, Delta, Mesa, and Garfield Counties, Colorado, form the Western Colorado Coal Operators' Association and vote to adopt a code of fair trade practices.

Oct. 21—An explosion, cause undetermined, kills 159 men in the Anna II mine of the Eschweiler Mining Co., near Alsdorf, Rhenish Prussia, Germany.

Oct. 25—Explosion in the French-controlled Maybach mine, near Friedrichsthal, in the Saar district of Germany, kills 113 men.

Oct. 27—Thirty men are killed in an explosion in the Wheatly No. 4 mine of the Samples Coal Co., McAlester, Okla.

Oct. 27—Plans for the amalgamation of 140 collieries in the Cheshire and Lancashire districts of England are completed by the mine owners. Annual production of the group is 18,000,000 tons.

Oct. 30—Explosion in the Richards mine of the Susquehanna Collieries Co., Shamokin, Pa., kills two men.

Oct. 30—Five men are killed in an explosion in the Fortenaille coal mine, near Montigny le Tilleul, Belgium.

Coal Mine Fatality Rate Decreases in September Lower Than in August or September, 1929

THE total number of men killed in all coal mines in the country in September, 1930, was 132, according to reports received by the U. S. Bureau of Mines from state mine inspectors. This is 78 less than the number killed in September, 1929, and 31 less than in August, 1930. Production of coal was: 51,877,000 net tons in September, 1929; 41,851,000 tons in August, 1930; and 43,925,000 tons in September, 1930. The death rate per million tons of coal mined, including both anthracite and bituminous, was lower in September than in August, or in September, 1929.

There were 99 fatalities in bituminous mines in September, and the production of coal was 38,632,000 tons, resulting in a death rate of 2.56. These figures indicate a reduction of 66 deaths and 6,702,000 tons of coal from the September (1929) totals, and a reduction of 18 deaths, accompanied by an increase in production of 2,971,000 tons of coal, from the number in August, 1930. In the anthracite mines, there were 33 fatalities in September, and the production of coal was 5,293,000 tons. The resulting fatality rate was 6.23, slightly less than the 6.68 figure of a year ago, which was based on 45 deaths and a production of 6,543,000 tons. The record for September also was better than August, when 46 men lost their lives in producing 6,190,000 tons of coal, resulting in a fatality rate of 7.43.

During the first nine months of 1930,

1,434 men were killed in both bituminous and anthracite mines, as compared with 1,563 deaths in the corresponding period in 1929. Accompanying the decrease in the number of deaths was a decrease in the production of coal from 441,860,000 tons in the first nine months of 1929 to 390,575,000 tons in the same period in 1930. This resulted in an increase in the fatality rate per million tons of coal mined of from 3.54 in 1929 to 3.67 in 1930. In the bituminous mines alone, 1,105 men were killed in producing 339,642,000 tons in the first nine months of 1930, as compared to 1,218 deaths and a production of 389,255,000 tons in 1929. Based on these figures, the death rate in 1930 was 3.25 for bituminous mines, slightly higher than the figure of 3.13 for 1929. There was little difference in the anthracite record, the rate for the 1929 period being 6.56, as compared to 6.46 in 1930. In the 1929 period, 345 men were killed and 52,605,000 tons was produced; in 1930, 329 men were killed, and 50,933,000 tons was mined.

There were no major disasters—in which five or more lives were lost—in September, but eight such disasters occurred in the months of January to August, inclusive, with a loss of 96 lives. In September, 1929, one major disaster occurred, killing eight men. In the first eight months of 1929, there were five disasters, resulting in 83 deaths.

Comparative fatality rates for the

Permissible Plates Issued

Five approvals of permissible equipment were issued by the U. S. Bureau of Mines in September, as follows:

(1) Jeffrey Mfg. Co.; Type 35-L low-vein cutting machine; 50-hp. motor, 220-440 volts, a.c.; Approvals 201 and 201A; Sept. 8.

(2) Sullivan Machinery Co.; Type CS-4, "Swivel-Shearer" cutting machine; 30-hp. motor, 250-500 volts, d.c.; Approvals 202 and 202A; Sept. 17.

(3) Gellatly & Co.; conveyor; 2-hp. motor, 230 volts; Approval 203; Sept. 23.

(4) Goodman Mfg. Co.; Type 636-AK3 entry loader; 35-hp. motor, 220 volts, a.c.; Approval 196; Sept. 29.

(5) General Electric Co.; Type LSB-2C5-F-324 storage battery locomotive; Approval 1552; Sept. 12.

nine-month periods of 1930 and 1929 are as follows:

Cause	1929	Jan.-Sept.— 1929	1930
All causes	3.592	3.537	3.672
Falls of roof and coal	1.941	1.906	2.020
Haulage	.678	.663	.597
Gas or dust explosions:			
Local explosions	.082	.088	.133
Major explosions	.238	.174	.218
Explosives	.145	.154	.151
Electricity	.133	.142	.156
Miscellaneous	.375	.410	.397

Coal Mine Fatalities During September, 1930, by Causes and States

(Compiled by Bureau of Mines and published by *Coal Age*)

State	Underground										Shaft				Surface						Total by States					
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives	Explosions of gas or coal dust	Explosives	Suffocation from mine gases	Electricity	Animals	Mining Machines	Mine fires (burned, suffocated, etc.)	Other causes	Total	Falling down shafts or slopes	Objects falling down shafts or slopes	Cage, skip, or bucket	Other causes	Total	Mine cars and mine locomotives	Electricity	Machinery	Boiler explosions or bursting steam pipes	Railway cars and locomotives	Other causes	Total	1930	1929
Alabama.....	2		1									3													3	5
Alaska.....																									0	0
Arkansas.....			1									1													1	1
Colorado.....																									0	4
Illinois.....	6											7													7	9
Indiana.....	2		1									3													3	5
Iowa.....																									0	0
Kansas.....	1											1													1	1
Kentucky.....	5		2				3					10													10	21
Maryland.....																									0	0
Michigan.....																									0	0
Missouri.....																									0	0
Montana.....																									0	0
New Mexico.....																									0	0
North Dakota.....	1											1													1	3
Ohio.....	3						1					4			1								1	1	6	8
Oklahoma.....																									0	9
Pennsylvania (bituminous).....	16	9	2						1		1	29			1			1						1	31	37
South Dakota.....																									0	0
Tennessee.....	1											1													1	3
Texas.....																									0	0
Utah.....	1				1							2													2	3
Virginia.....																									0	3
Washington.....																			1	1					1	2
West Virginia.....	15	4	5				5		1			30						1						1	31	48
Wyoming.....	1											1													1	3
Total (bituminous).....	54	13	12		1		9		2		2	93			2		2	1	1	1				1	99	165
Pennsylvania (anthracite).....	11	3	2	8	3		1				3	31										1	1	2	33	45
Total, September, 1930.....	65	16	14	8	4		10		2		5	124			2		2	1	1	1		1	2	6	132	
Total, September, 1929.....	105	18	37	14	9		5		3	1	2	194	1					5	2			4	4	15		210

Financial Reports Issued

Island Creek Coal Co. reports, for the three months ended Sept. 30, net earnings of \$562,428 after depreciation, depletion, federal taxes, and other charges, equivalent, after dividend requirements on the \$6 preferred stock, to 87c. a share on 593,865 shares of common stock. This compares with \$531,177, or 81c. a share, in the preceding quarter, and \$766,903, or \$1.21 a share, in the same period in 1929.

United Electric Coal Cos., for the fiscal year ended July 31, reports net earnings of \$302,795, as compared to \$371,380 in the preceding fiscal year.

Lehigh Valley Coal Corporation reports for the quarter ended Sept. 30 net profit of \$183,508, after interest, taxes, depreciation, depletion, and minority interest, equivalent after dividend requirements on 6 per cent preferred stock, to 1c. a share on 1,201,037 no-par shares of common stock. This compares with a net loss of \$140,992 in the preceding quarter, and a net profit of \$358,683, equal to 16c. a share on 1,196,341 common shares, in the third quarter of 1929. For the nine months ended Sept. 30, a net loss of \$105,010 after above charges was reported, as compared with a net profit of \$664,509, equal to 13c. a share on 1,196,341 common shares, in those months of 1929.

M. A. Hanna Co., for the quarter ended Sept. 30, reports net earnings of \$701,405, after depreciation, depletion, interest, federal taxes, and other charges, as compared to net earnings of \$1,295,260 in the corresponding period in 1929. For the first nine months of 1930, the net earnings were \$1,805,097 after the above charges, against net earnings of \$3,028,714 in the same period in 1929.

Pittsburgh Terminal Coal Corporation, for the quarter ended Sept. 30, reports a net loss of \$116,204 after depreciation, depletion, etc., against a net loss of \$206,776 in the preceding quarter and \$186,104 in the same quarter in 1929. Net loss for the first nine months of 1930, after above charges, was \$539,634, against a net loss of \$507,468 in the first nine months of 1929.

Virginia Iron, Coal & Coke Co., for the three months ended Sept. 30, reports a net loss of \$282, after interest, depreciation, depletion, and other charges, against a net loss of \$11,929 in the third quarter of 1929. For the nine months ended Sept. 30, net loss reported was \$110,502, after above charges, as compared with a net loss of \$39,893 in the same period in 1929.

United States Distributing Corporation and subsidiaries, for the nine months ended Sept. 30, report a consolidated net profit of \$349,827 after depreciation, depletion, interest, and federal taxes, equivalent after dividend requirements on 6 per cent prior preference stock of Pattison & Bowns, Inc., to \$3.20 a share on 103,526 shares of 7 per cent preferred stock. This compares with a net profit of \$750,791 in the first nine months of 1929, equivalent after dividend requirements on 6 per

cent prior preference stock of Pattison & Bowns, Inc., and 7 per cent preferred stock of the United States Distributing Corporation, to 49c. a share on 387,434 shares of no-par common stock. Consolidated net profit for the quarter ended Sept. 30 was \$121,182, after above charges, equal to \$1.11 a share on the 7 per cent preferred stock, against \$108,756, or 99c. a share, in the preceding quarter and \$211,924, or 6c. a share on the common stock, in the third quarter of 1929.

Accident Prevention Work Begun

The official personnel of several coal-mining companies operating at Jerome, Pa., will take a course in accident prevention this winter, as a result of three years of preparation by U. S. Bureau of Mines men. Primarily,

the course is for mining officials from the president down to the fireboss, and it will cover explosions and fire prevention; falls of roof and coal; accident statistics; haulage accidents, electrical accidents; explosives; ventilation; and health and sanitation. The Bureau is prepared to give the course in other mining districts which evidence a desire for it.

Alabama Institute Elects

Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., was elected president of the Alabama Mining Institute last month. A. B. Aldridge, Birmingham, president, Southeastern Fuel Co., and James L. Davidson, Birmingham, were chosen vice-president and secretary-treasurer, respectively.

Industrial Notes

W. S. STEWART, formerly in charge of the Pacific Coast office of the Lincoln Electric Co., Cleveland, Ohio, has been made Cleveland district manager.

GORDON F. DAGGETT, Milwaukee, Wis., executive secretary of the Wisconsin Mineral Aggregate Association, has been appointed Wisconsin representative of the Stephens-Adamson Mfg. Co., Aurora, Ill.

J. H. HORLICK, JR., has been made assistant director of sales, explosives department, Hercules Powder Co., Wilmington, Del. J. BARAB succeeds Mr. Horlick as manager of the service division of the explosives department.

SALES, accounting, and manufacturing operations of the A-A Wire Co.; American Insulated Wire & Cable Co.; Atlantic Insulated Wire & Cable Co.; Detroit Insulated Wire Co., Dudlo Mfg. Co., Peerless Insulated Wire & Cable Co., Phillips Wire Co., Rome Electrical Co., Rome Wire Co., Safety Cable Co., Standard Underground Cable Co., and Southern States Cable Co., which have operated as separate divisions in the past, have been combined in a single organization, the General Cable Corporation, Rome, N. Y.

RAY P. TARBELL, Cleveland (Ohio) district sales manager, Lincoln Electric Co., has become a member of Robert E. Kinkead, Inc., consulting welding engineers.

L. B. MEAD, Indianapolis (Ind.) manager for the Westinghouse Electric & Mfg. Co., has been made assistant industrial manager of the Northwest territory. WM. J. MORGAN succeeds Mr. Mead as Indianapolis manager.

J. K. WEBB, Dallas, Texas, has been made Texas district sales agent of the Roller-Smith Co., New York.

CHICAGO PNEUMATIC TOOL Co., New York City, has opened a service station in Detroit, Mich., for its line of portable tools.

GOODMAN MFG. Co., Chicago, has been appointed exclusive sales agent for the "Red-Devil" pit-car loader of the Chicago Automatic Conveyor Co., in the United States, Canada, and Mexico, for the Conway power shovel of the St. Louis Power Shovel Co., in Mexico, Arizona and New Mexico.

B. L. DONAHUE has been made manager of the Buffalo (N. Y.) district office of Cutler-Hammer, Inc., vice B. A. Hansen, resigned.

WORTHINGTON PUMP & MACHINERY CORPORATION, New York City, has purchased the pneumatic rock-drilling line of equipment of the Gilman Mfg. Co., East Boston, Mass., by acquiring the company.

CHAIN BELT Co., Milwaukee, Wis., has appointed the following new distributors: Alabama Machinery & Supply Co., Montgomery, Ala., and the Concrete Products Sales Co., Ltd., Oakland, Calif.

J. T. CONNERS, district manager, Thew Shovel Co., Detroit, Mich., has gone with the American Hoist & Derrick Co., St. Paul, Minn., to take charge of sales in the field.

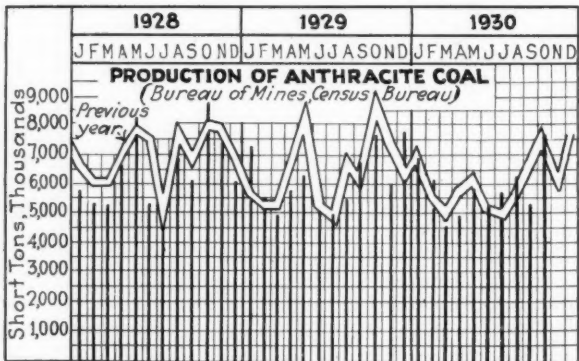
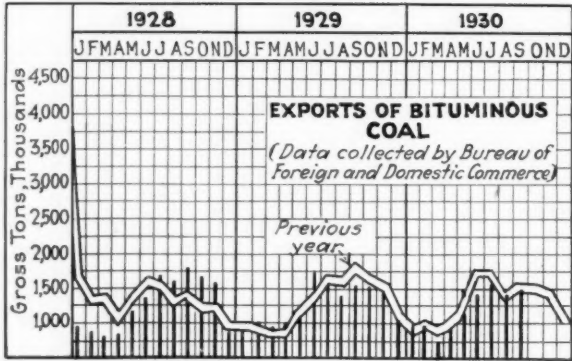
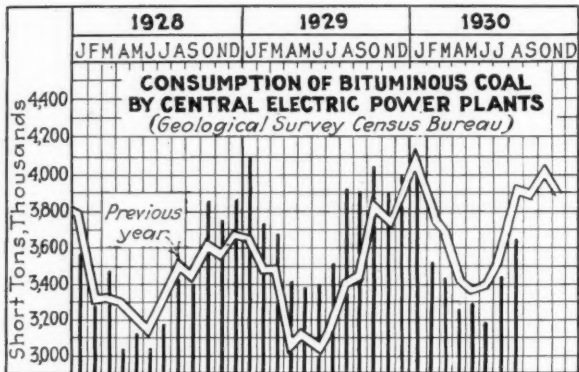
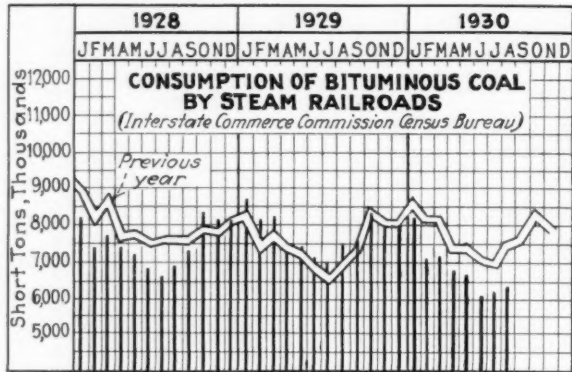
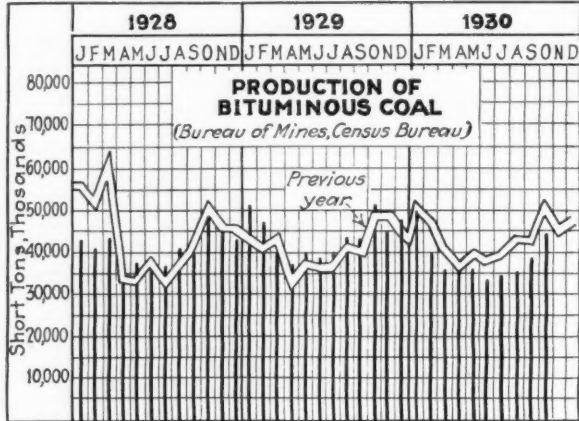
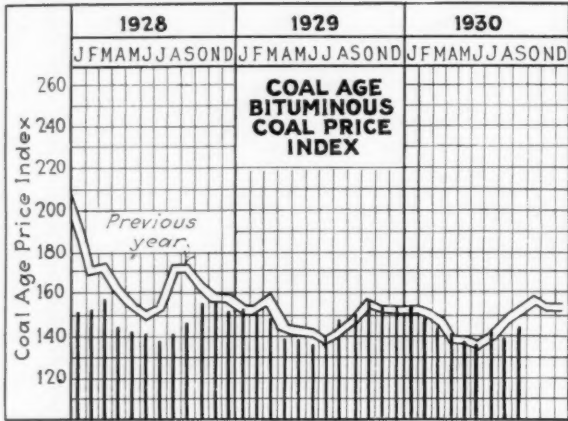
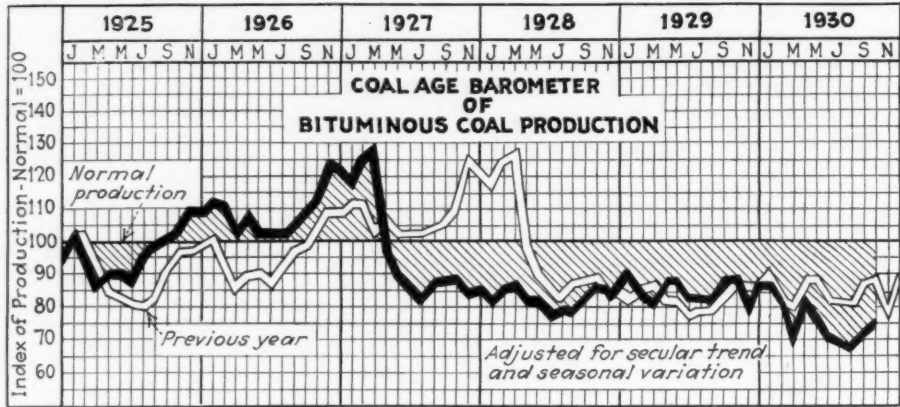
F. J. MORAN, formerly with the sales staff of the General Electric Co., has been made Philadelphia (Pa.) district manager for the Lecourtenay Co., Newark, N. J., maker of centrifugal pumps.

CARBON SALES DIVISION of the National Carbon Co., Inc., Cleveland, Ohio, has taken over the merchandising of the entire line of "Gredag" lubricants, manufactured by the Acheson Graphite Corporation, a unit of the Union Carbide & Carbon Corporation, New York City.

G. H. BOLLE, New York City, has been made district representative of the Coppus Engineering Corporation, Worcester, Mass.

L. J. WING MFG. Co., New York City, has appointed the Harry G. Murphy Sales Co., Scranton, Pa., northeastern Pennsylvania sales representatives for blowers, fans and heaters.

Indicators of Activities in the Coal Industry



MARKETS

in Review

COLD WEATHER in October brought in its train a brisk demand for domestic sizes in the coal markets of the country. However, all of this class failed to share equally in the increased business. The "in-between" sizes, egg, stove, and nut in particular, were not favored with much attention and went through the month without perceptible gains. A glut of slack and screenings, resulting from the increased production of domestic sizes, also operated to hold down the "in-between" sizes and, in addition, to depress the whole steam range. The surplus in many cases became so great as to force curtailments in production, and reports of give-away prices were numerous.

October production of bituminous coal is estimated by the U. S. Bureau of Mines at 44,337,000 net tons, an increase of 5,705,000 tons over the production in September and a decrease of 7,837,000 tons from the output in October, 1929. Anthracite production is estimated at 7,548,000 net tons for October. This compares with 5,293,000 tons in the preceding month and 8,026,000 tons in October last year.

Coal Age Index of spot bituminous prices (preliminary) was: 148, Oct. 4; and 149, Oct. 11, 18, and 25. Corresponding weighted average prices were: \$1.79, Oct. 4; and \$1.80, Oct. 11, 18, and 25. Revised Index figures for September were: 142, Sept. 6; 143, Sept. 13; and 147, Sept. 20 and 27. Corresponding weighted average prices were: \$1.72, Sept. 6; \$1.73, Sept. 13; and \$1.78, Sept. 20 and 27. The monthly Index for September was 144½, as compared to the unrevised figure of 148½ for October.

Dumpings at the lower Lake ports were at a slightly higher rate in October

than in the same month last year. Total dumpings to Oct. 27 were: cargo, 32,564,041 tons; fuel, 1,169,571 tons; total, 33,733,612 tons. In the same period in 1929, dumpings were: cargo, 32,776,115 tons; fuel, 1,281,436 tons; total, 34,057,551 tons.

Cold weather resulted in a boom in domestic sizes in the anthracite markets of the country in October. Chestnut and stove were the leading sizes. Pea also was in good demand, but egg was slow at all times. In the steam division, buying was not so brisk, though the former strong demand for buckwheat continued. Producers, however, were not so short on this size as in the past. Rice and barley were slow to move.

THOUGH domestic demand in the Chicago market was stimulated by cold weather in October, it did not come up to expectations, while steam buying failed to show any improvement. However, the more lively demand for large sizes enabled operators in Illinois, Indiana, eastern and western Kentucky, and southern West Virginia to clean up accumulations of "no bills." Prices became firmer as the movement gained headway. But spot demand was at no time brisk, despite extremely low supplies in the hands of the public. Credit also continued to exert a retarding effect on household buying.

Smokeless lump, egg, and nut were scarce over the month as a result of curtailed production because of the faltering demand for slack. However, the shortage developed no unusual call for spot coal, and despite the lack of the domestic sizes, consumers did not turn to any of the substitutes, preferring to purchase smokeless mine-run. This move, though, did not make mine-run

any too active. Good quality coal sold at \$2.25, with some off-grades at \$1.75 up. There were no changes in domestic prices. Byproduct slack was held firmly by the producers in an attempt to protect contract prices, of \$1.35@1.50, against offers from other industrial buyers of 90c.@1.10 for byproduct coal and 50c. for steam coal.

EASTERN high-volatile slack for small stokers. sold at \$1@1.25. Steam slack went at 40c. and up. In many cases the operators shipped less than one-third on steam contracts. Despite small takings and curtailed production, more lump and egg came into the market than could readily be absorbed. Block sold at \$1.90@2.50 for ordinary grades, while the higher grades went at \$2.75@3.50. Egg prices were low, as follows: secondary grades, \$1.40 up; premium grades, \$2@2.50. Screenings were a source of grief to the operators in parts of Illinois and in Indiana and western Kentucky. In Illinois and Indiana, seconds went for 40c., and in some cases Belleville (Ill.) screenings were sacrificed for the freight. Western Kentucky screenings sold at 15c.@40c. Regular companies in southern Illinois held their product at \$1.20@1.60. Independents, however, scouted for business at \$1@1.10.

Cold weather at the end of October in the St. Louis market resulted in a rush for domestic sizes, the first activity of any note for the season. Slack prices, already weak, slumped to new low levels under the pressure of increased tonnage resulting from greater production to supply the demand for domestic sizes.

An unduly light seasonal demand featured the market at the Head of the Lakes in October, despite temporary

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market Quoted	Oct. 4, 1930		Oct. 11, 1930		Oct. 18, 1930		Oct. 25, 1930	
	Independent	Company	Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$8.50	\$8.50	\$8.50	\$8.50
Broken.....	Philadelphia.....	8.65	8.65	8.65	8.65	8.65	8.65	8.65
Egg.....	New York.....	\$8.50@8.65	8.65	\$8.50@8.65	8.65	\$8.50@8.65	8.65	8.65
Egg.....	Philadelphia.....	8.65@8.90	8.65	8.65@8.90	8.65	8.65@8.90	8.65	8.65
Egg.....	Chicago*.....	7.77	7.77	7.77	7.77	7.77	7.77	7.77
Stove.....	New York.....	9.00@9.15	9.15	9.15	9.15	9.15	9.15	9.15
Stove.....	Philadelphia.....	9.15@9.40	9.15	9.15@9.40	9.15	9.15@9.40	9.15	9.15
Stove.....	Chicago*.....	8.21	8.21	8.21	8.21	8.21	8.21	8.21
Chestnut.....	New York.....	8.40@8.65	8.65	8.50@8.65	8.65	8.50@8.65	8.65	8.65
Chestnut.....	Philadelphia.....	8.65@8.90	8.65	8.65@8.90	8.65	8.65@8.90	8.65	8.65
Chestnut.....	Chicago*.....	7.77	7.77	7.77	7.77	7.77	7.77	7.77
Pea.....	New York.....	4.75@5.00	5.00	5.00	5.00	5.00	5.00	5.00
Pea.....	Philadelphia.....	5.00@5.25	5.00	5.00@5.25	5.00	5.00@5.25	5.00	5.00
Pea.....	Chicago*.....	4.46	4.46	4.46	4.46	4.46	4.46	4.46
Buckwheat.....	New York.....	3.00@3.25	3.00†	3.00@3.25	3.00†	3.00@3.15	3.00†	3.00†
Buckwheat.....	Philadelphia.....	3.00@3.25	3.00	3.00@3.25	3.00	3.00@3.25	3.00	3.00
Rice.....	New York.....	1.65@1.90	2.00	1.75@2.00	2.00	1.75@2.00	2.00	2.00
Rice.....	Philadelphia.....	2.00@2.10	2.00	2.00@2.10	2.00	2.00@2.10	2.00	2.00
Barley.....	New York.....	1.15@1.40	1.50	1.15@1.40	1.50	1.15@1.40	1.50	1.50
Barley.....	Philadelphia.....	1.50@1.60	1.50	1.50@1.60	1.50	1.50@1.60	1.50	1.50

*Net tons f.o.b. mines. †Domestic buckwheat, \$3.50 (D., L. & W.)

spurts caused by cold snaps. Estimates show that shipments from the docks will fall materially below the October, 1929, figure of 26,069 cars and last month's total of 18,603 cars. Shipments to power companies were the principal activity during the month, with some takings by the iron-mining companies. Salesmen met with some success in closing contracts with buyers desirous of laying in supplies for the winter. Some disposition to purchase lower grades of coal was evident over the month. This trend is said to be due to the increasing use of mechanical firing equipment. Prices were unchanged from the preceding month.

Freezing temperatures in the Southwest after the middle of October ended the waiting policy pursued by both steam and domestic buyers. Prices on Kansas lump coal strengthened at the end of the month, while those on other sizes held firm.

The continuation of Indian summer materially retarded the movement of domestic coal in the Colorado market in October. Dealers, as a rule, refused to

place orders for storage coal and persisted in hand-to-mouth tactics. Prices were unchanged from those prevailing in September.

Chilly weather in the Louisville market after Oct. 20 created a brisk demand for block coal. Egg, stove, and nut, however, failed to share in the improvement, and were sold for whatever the producers could get. Steam sizes, especially slack, continued in the slump of previous months. There was some continuance in the movement from eastern Kentucky to the Lakes, but with the close of navigation it is expected that a large tonnage will have to find another market. Prevailing prices were as follows: western Kentucky block, \$2.25; mine-run, \$1@1.25; screenings, 35@40c.; eastern Kentucky block, \$2.25; mine-run, \$1.30@1.60; slack, 75c. Egg, nut, and small lump went for whatever the producer could move it for.

BONANZA prices on the large sizes and give-away quotations on small coal featured the Cincinnati market in October. To further confuse the mar-

ket, nobody evidenced any interest in the "in-between" coals. This attitude worked perhaps the greatest hardship of all. Unequal distribution of orders was given as the cause, though some railed against the "captive tonnage" corralled by certain groups, which allowed market manipulation almost at will. The mid-month cold spell confirmed the principle of hand-to-mouth buying on the part of consumers. Frosty weather was immediately reflected in brisk demand which, however, disappeared on the first balmy day. Lake business tapered off over the month, bringing in its train the problem of disposal of a still greater tonnage of the smaller sizes.

High-volatile slack prices continued at sacrifice levels. For some unknown reason egg commanded little or no interest. Brisk demand for 4- and 6-in. lump and block operated to thrust increasing tonnages of egg into the "no-bill" class, which even a cold snap could not absorb. Smokeless lump and egg held firm at 25@50c. over contract prices. One or two firms broke away from tradition and asked \$4 for lump and \$4.25 for egg from contract takers. All others quoted lump at \$3.50 and egg at \$3.75. Stove was active over the month, with ascending prices. Some retailers with screening facilities purchased mine-run from which to separate that size. Both the high- and low-volatile slack markets were in distress. Producers of smokeless byproduct slack refused to retreat from a price level of \$1.25@1.35. Steam slack sold at \$1, with considerable tonnage going at still lower prices.

THE advent of cold weather in the Columbus market in October caused a boom in domestic sizes. Smokeless coals and premium splints led the list, followed closely by Hocking, Pomeroy, and Cambridge varieties. Retail business was almost normal, and some disposition to replenish stocks was noted. Slack continued to be the stumbling block in the market, and operators in all of the Ohio, West Virginia, and Kentucky fields were hard put to dispose of their production, even at low prices of 35@50c. Other steam grades were quiet, though a fair demand for mine-run carried over the month.

Some improvement in the Cleveland market was noticeable in October, though it extended only to domestic lump. Slack was a drug on the market. Industries and railroads bought only for immediate needs, and supplies of all coal were plentiful.

An increase in the demand for domestic sizes featured the Pittsburgh market in October, but the advance was not sufficient to raise the price level from the former range of \$2@2.35. On the other hand, the failure of the steam market to come out of the prevailing slump resulted in accumulations of slack at the mines, and in some sales at as low as 35c. Gas slack, however, finished the month in a good position as a result of the steady demand for that grade. There was no change in the prices on industrial lump and mine-run coals.

Current Quotations—Spot Prices, Bituminous Coal— Net Tons, F.O.B. Mines

LOW-VOLATILE, EASTERN	Market Quoted	Week Ended—			
		Oct. 4, 1930	Oct. 11, 1930	Oct. 18, 1930	Oct. 25, 1930
Smokeless lump.....	Chicago	\$3.50@3.75	\$3.50@3.75	\$3.50@3.75	\$3.50@3.75
Smokeless egg.....	Chicago	3.75@3.90	3.75@3.90	3.75@3.90	3.75@3.90
Smokeless stove.....	Chicago	3.50	3.50	3.50	3.50
Smokeless nut.....	Chicago	2.25	2.25	2.25	2.25
Smokeless mine-run.....	Chicago	1.75@2.25	1.75@2.25	1.75@2.25	1.75@2.25
Smokeless slack.....	Chicago	.50@1.50	.50@1.50	.50@1.50	.50@1.50
Smokeless lump.....	Cincinnati	3.50@4.00	3.50@4.00	3.50@4.00	3.50@4.00
Smokeless egg.....	Cincinnati	3.75@4.00	3.75@4.00	3.75@4.00	3.75@4.00
Smokeless stove.....	Cincinnati	2.85@3.25	2.85@3.25	2.85@3.50	2.85@3.50
Smokeless nut.....	Cincinnati	2.25	2.25	2.10@2.25	2.25
Smokeless mine-run.....	Cincinnati	1.75@2.25	1.85@2.25	1.85@2.25	2.00@2.25
Smokeless slack.....	Cincinnati	1.00@1.35	1.00@1.35	1.00@1.35	1.00@1.35
*Smokeless nut-and-slack.....	Boston	3.50@3.60	3.50@3.60	3.55@3.60	3.60@3.70
*Smokeless mine-run.....	Boston	4.00@4.15	4.10@4.20	4.10@4.25	4.10@4.25
Clearfield, mine-run.....	Boston	1.40@1.60	1.40@1.60	1.35@1.60	1.35@1.60
Clearfield mine-run.....	New York	1.75@2.00	1.75@2.00	1.75@2.00	1.75@2.00
Cambria mine-run.....	Boston	1.65@2.00	1.65@2.00	1.60@1.90	1.60@1.90
Somersett mine-run.....	Boston	1.55@1.80	1.55@1.80	1.55@1.75	1.50@1.75
Pool 1 (Navy Standard).....	New York	2.25@2.50	2.25@2.50	2.25@2.50	2.25@2.50
Pool 1 (Navy Standard).....	Philadelphia	2.25@2.60	2.25@2.60	2.25@2.60	2.25@2.60
Pool 9 (Super low-vol.).....	New York	1.75@2.00	1.75@2.00	1.75@2.00	1.75@2.00
Pool 9 (Super low-vol.).....	Philadelphia	1.75@2.00	1.75@2.00	1.75@2.00	1.75@2.00
Pool 10 (h. gr. low-vol.).....	New York	1.60@1.75	1.60@1.75	1.60@1.75	1.60@1.75
Pool 10 (h. gr. low-vol.).....	Philadelphia	1.60@1.75	1.60@1.75	1.60@1.75	1.60@1.75
Pool 11 (low-vol.).....	New York	1.50@1.60	1.50@1.60	1.50@1.60	1.40@1.60
Pool 11 (low-vol.).....	Philadelphia	1.50@1.60	1.50@1.60	1.50@1.60	1.50@1.60
HIGH-VOLATILE, EASTERN					
Pool 54-64 (gas and st.).....	New York	\$1.00@1.20	\$1.00@1.20	\$1.00@1.20	\$0.95@1.15
Pool 54-64 (gas and st.).....	Philadelphia	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25
Pittsburgh sc'd gas.....	Pittsburgh	1.70@1.80	1.70@1.80	1.70@1.80	1.70@1.80
Pittsburgh gas mine-run.....	Pittsburgh	1.50@1.60	1.50@1.60	1.50@1.60	1.50@1.60
Pittsburgh mine-run.....	Pittsburgh	1.30@1.60	1.30@1.60	1.30@1.60	1.30@1.60
Pittsburgh slack.....	Pittsburgh	.90@1.00	.90@1.00	.90@1.00	.90@1.00
Connellsville coking coal.....	Pittsburgh	1.40@1.75	1.40@1.75	1.40@1.75	1.40@1.75
Westmoreland lump.....	Philadelphia	2.25@2.50	2.25@2.50	2.25@2.50	2.25@2.50
Westmoreland egg.....	Philadelphia	1.75@1.85	1.75@1.85	1.75@1.85	1.75@1.85
Westmoreland 1-in. lump.....	Philadelphia	1.80@1.90	1.80@1.90	1.80@1.90	1.80@1.90
Westmoreland mine-run.....	Philadelphia	1.65@1.75	1.65@1.75	1.65@1.75	1.65@1.75
Westmoreland slack.....	Philadelphia	1.05@1.25	1.05@1.25	1.05@1.25	1.05@1.25
Fairmont lump.....	Fairmont	1.40@1.90	1.40@1.90	1.50@1.90	1.60@2.00
Fairmont 1-in. lump.....	Fairmont	1.25@1.55	1.30@1.60	1.30@1.60	1.30@1.60
Fairmont mine-run.....	Fairmont	1.15@1.35	1.15@1.35	1.15@1.35	1.15@1.35
Fairmont slack.....	Fairmont	.75@.90	.70@.90	.70@.90	.70@.90
Kanawha lump.....	Cincinnati	1.75@2.75	1.75@2.75	1.75@2.75	1.85@2.75
Kanawha egg.....	Cincinnati	1.30@1.65	1.30@1.60	1.30@1.60	1.25@1.50
Kanawha nut-and-slack.....	Cincinnati	.50@.75	.40@.60	.45@.60	.40@.65
Kanawha mine-run (gas).....	Cincinnati	1.40@1.65	1.35@1.65	1.35@1.60	1.40@1.60
Kanawha mine-run (st.).....	Cincinnati	1.10@1.35	1.10@1.35	1.10@1.35	1.10@1.35
Williamson (W. Va.) lump.....	Cincinnati	1.75@2.50	1.75@2.50	1.75@2.50	1.75@2.50
Williamson (W. Va.) egg.....	Cincinnati	1.30@1.60	1.30@1.65	1.25@1.65	1.25@1.60
Williamson (W. Va.) nut-and-slack.....	Cincinnati	.50@.75	.40@.60	.45@.65	.40@.60
Williamson (W. Va.) mine-run (gas).....	Cincinnati	1.35@1.60	1.35@1.60	1.35@1.60	1.35@1.60
Williamson (W. Va.) mine-run (st.).....	Cincinnati	1.10@1.35	1.10@1.35	1.10@1.35	1.10@1.35
Logan (W. Va.) lump.....	Cincinnati	1.75@2.25	1.75@2.50	1.75@2.50	1.75@2.50
Logan (W. Va.) egg.....	Cincinnati	1.25@1.65	1.25@1.60	1.25@1.60	1.25@1.50
Logan (W. Va.) nut-and-slack.....	Cincinnati	.50@.75	.40@.60	.40@.60	.45@.60
Logan (W. Va.) mine-run.....	Cincinnati	1.10@1.40	1.10@1.40	1.10@1.35	1.10@1.35
Logan (W. Va.) slack.....	Cincinnati	.35@.65	.30@.50	.30@.50	.30@.50
Hocking (Ohio) lump.....	Columbus	1.90@2.00	1.90@2.00	1.90@2.00	1.90@2.00
Hocking (Ohio) nut-and-slack.....	Columbus	.70@.90	.70@.85	.75@.90	.75@.90
Hocking (Ohio) mine-run.....	Columbus	1.40@1.65	1.40@1.65	1.40@1.65	1.40@1.65
Pitts. No. 8 (Ohio) lump.....	Cleveland	1.40@1.50	1.40@1.50	1.40@1.50	1.40@1.50
Pitts. No. 8 (Ohio) 1-in. lump.....	Cleveland	1.25@1.35	1.25@1.35	1.25@1.35	1.25@1.35
Pitts. No. 8 (Ohio) mine-run.....	Cleveland	1.10@1.15	1.10@1.15	1.10@1.15	1.10@1.15
Pitts. No. 8 (Ohio) slack.....	Cleveland	.50@.60	.50@.60	.50@.60	.50@.60

*Gross tons, f.o.b. vessels, Hampton Roads.

Cold weather in most of the territory supplied by northern West Virginia mines resulted in an improvement in the demand for domestic sizes, particularly 4-in. and 3-in. lump. Prices, however, showed only a slight tendency to rise. Increased production to supply the domestic demand resulted in an oversupply of slack. Consequently, quotations went to the bottom of the list and trouble was encountered in disposing of the production.

COLD weather offered some comfort to the central Pennsylvania market in October, though the increase in demand was not sufficient to raise the price level. Quotations prevailing at the end of the month were: Pool 1, \$2.35; Pool 71, \$2.15@2.35; Pool 9, \$1.85@2.10; Pool 10, \$1.65@1.85; Pools 11 and 18, \$1.55@1.65.

The New England market in October reflected the generally dull business situation. Buying was spotty, though the price cutting prevalent in September was materially reduced. Accumulations at the Virginia terminals also were smaller, with less pressure on the buyers and a corresponding steadiness in the market. Navy Standard smokeless mine-run was quoted at \$4.10@4.25 per gross ton, f.o.b. vessel, Virginia terminals. Some sales at higher figures were made on certain fancy grades. Nut-and-slack continued to be a drug on the market, with quotations at \$3.64. All-rail movement from central Pennsylvania was extremely light.

Increased buying for heating purposes made an appearance in the New York market in October, though the demand for steam coal failed to expand to any great extent. Industrial plants continued on a part-time basis, with correspondingly decreased fuel consumption. And in view of the uncertain future and the ease with which supplies could be obtained on short notice, consumers were not disposed to add to stocks. Some moderate additions were made, however, particularly by public utilities through increased takings on contracts. The average industrial user continued to take tonnage on contract at about the same rate as in September. Increased sales of domestic sizes resulted in a glut in the slack market, with consequent price weakness. Lump and other domestic sizes were firm or slightly higher in price. Mine-run was unchanged.

Increase in the demand for coal in the Philadelphia market proved disappointing to the trade. Consumers showed no disposition to add to the small reserves on hand, largely because of the ease with which additional supplies could be obtained when wanted. Weak spots were discernible in the price structure, which at times affected the whole list, with the possible exception of premium varieties. The tidewater market was quiet, bunkering constituting the whole of the sales.

Domestic buying in the Birmingham market, though sporadic, showed a definite upturn in October. Hand-to-mouth buying still prevailed, however. Prices were unchanged from those prevailing

in September. Continued dullness featured the steam sizes. Slack accumulations resulting from the increased domestic output were an especially embarrassing factor to the producers. In many instances, prices were slashed to the bone to move tonnage from the mines. Prevailing steam quotations were: mine-run, \$1.60@2.25; washed, \$1.50@2.25; screenings, \$1.25@1.50, shaded as conditions demanded.

Demand for anthracite fluctuated sharply in the New York market in October, in response to changes in temperature. A cold snap at the first of the month stimulated buying, which became somnolent with the return of warm weather. However, a cold wave beginning Oct. 20 brought in so many orders that producers were oversold on certain sizes. Warm weather at the end of the month resulted in another subsidence in activity. Buying over the month as a whole was not as sustained as in Octo-

ber, 1929, and the total volume of sales was smaller. Chestnut and stove were the leading sizes, and independent prices were firm at company circulars. Pea also was in good demand at generally firm prices, but egg was in oversupply, with independents granting concessions of 25@50c. Buckwheat was easier as the month wore on. Rice and barley were slow.

October proved to be an active month in the Philadelphia anthracite market. Cool weather boomed household buying, but producers were able to take care of the demand without running behind. Chestnut led the list, though the supply was ample at all times. Stove also moved briskly, while pea picked up at the last of the month. Egg was difficult to move at all times. In the steam sizes, buckwheat was the favorite, and the strong demand for this size diverted actual purchases of tonnage to the smaller sizes, particularly rice and barley.

Current Quotations—Spot Prices, Bituminous Coal— Net Tons, F.O.B. Mines

		Week Ended			
		Oct. 4, 1930	Oct. 11, 1930	Oct. 18, 1930	Oct. 25, 1930
MIDDLE WEST					
Franklin (Ill.) lump.....	Chicago.....	\$3.25	\$3.25	\$3.25	\$3.25
Franklin (Ill.) egg.....	Chicago.....	2.75@ 3.00	2.75@ 3.00	2.75@ 3.00	2.75@ 3.00
Franklin (Ill.) mine-run.....	Chicago.....	2.15	2.15	2.15	2.15
Franklin (Ill.) screenings.....	Chicago.....	1.20@ 1.60	1.20@ 1.60	1.20@ 1.60	1.20@ 1.60
Central Ill. lump.....	Chicago.....	2.40@ 2.65	2.40@ 2.65	2.40@ 2.65	2.40@ 2.65
Central Ill. egg.....	Chicago.....	1.85@ 2.40	1.85@ 2.40	1.85@ 2.40	1.85@ 2.40
Central Ill. mine-run.....	Chicago.....	1.70	1.70	1.70	1.70
Central Ill. screenings.....	Chicago.....	.50@ 1.00	.50@ 1.00	.50@ 1.00	.40@ 1.00
Ind. 4th Vein lump.....	Chicago.....	2.50@ 2.75	2.50@ 2.75	2.50@ 2.75	2.50@ 2.75
Ind. 4th Vein egg.....	Chicago.....	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50
Ind. 4th Vein mine-run.....	Chicago.....	1.65@ 2.00	1.65@ 2.00	1.65@ 2.00	1.65@ 2.00
Ind. 4th Vein screenings.....	Chicago.....	.90@ 1.40	.90@ 1.40	.90@ 1.40	.90@ 1.40
Ind. 5th Vein lump.....	Chicago.....	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50
Ind. 5th Vein egg.....	Chicago.....	2.00@ 2.15	2.00@ 2.15	2.00@ 2.15	2.00@ 2.15
Ind. 5th Vein mine-run.....	Chicago.....	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85
Ind. 5th Vein screenings.....	Chicago.....	.40@ 1.10	.40@ 1.10	.40@ 1.10	.45@ 1.10
Mt. Olive (Ill.) lump.....	St. Louis.....	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50
Mt. Olive (Ill.) egg.....	St. Louis.....	1.85@ 2.25	1.85@ 2.25	1.85@ 2.25	1.85@ 2.25
Mt. Olive (Ill.) mine-run.....	St. Louis.....	1.65	1.65	1.65	1.65
Mt. Olive (Ill.) screenings.....	St. Louis.....	.50@ .75	.50@ .75	.40@ .60	.35@ .50
Standard (Ill.) lump.....	St. Louis.....	1.90@ 2.25	1.90@ 2.25	1.90@ 2.25	1.90@ 2.25
Standard (Ill.) egg.....	St. Louis.....	1.75@ 2.10	1.75@ 2.10	1.75@ 2.10	1.75@ 2.10
Standard (Ill.) mine-run.....	St. Louis.....	1.50	1.50	1.50	1.50
Standard (Ill.) screenings.....	St. Louis.....	.35@ .50	.35@ .50	.25@ .40	.25@ .35
West Ky. lump.....	Louisville.....	2.00@ 2.25	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50
West Ky. egg.....	Louisville.....	1.75@ 2.00	1.60@ 2.00	1.75@ 2.25	1.75@ 2.25
West Ky. mine-run.....	Louisville.....	.85@ 1.25	.85@ 1.25	1.00@ 1.25	1.00@ 1.25
West Ky. slack.....	Louisville.....	.40@ .50	.30@ .50	.35@ .60	.25@ .50
West Ky. lump.....	Chicago.....	2.25	2.25	2.25	2.25
West Ky. egg.....	Chicago.....	2.00	2.00	2.00	2.00
West Ky. slack.....	Chicago.....	.35@ .55	.35@ .55	.35@ .55	.25@ .50
SOUTH AND SOUTHWEST					
Big Seam lump.....	Birmingham.....	\$2.25	\$2.25	\$2.25	\$2.25
Big Seam mine-run.....	Birmingham.....	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75
Harlan (Ky.) block.....	Chicago.....	2.50@ 2.75	2.50@ 2.75	2.50@ 2.75	2.50@ 2.75
Harlan (Ky.) egg.....	Chicago.....	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85
Harlan (Ky.) slack.....	Chicago.....	.50@ .90	.50@ .90	.50@ .90	.50@ .90
Harlan (Ky.) block.....	Louisville.....	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50
Harlan (Ky.) egg.....	Louisville.....	1.40@ 1.75	1.50@ 1.75	1.50@ 1.75	1.60@ 1.85
Harlan (Ky.) nut-and-slack.....	Louisville.....	.60@ .75	.50@ .75	.50@ .75	.50@ .75
Harlan (Ky.) mine-run.....	Louisville.....	1.40@ 1.60	1.35@ 1.50	1.40@ 1.60	1.40@ 1.60
Harlan (Ky.) block.....	Cincinnati.....	2.00@ 2.75	2.00@ 3.00	2.00@ 3.00	2.00@ 3.00
Harlan (Ky.) egg.....	Cincinnati.....	1.35@ 1.75	1.30@ 1.75	1.30@ 1.75	1.30@ 1.65
Harlan (Ky.) nut-and-slack.....	Cincinnati.....	.50@ .75	.50@ .75	.60@ .75	.50@ .75
Harlan (Ky.) mine-run.....	Cincinnati.....	1.25@ 1.65	1.25@ 1.60	1.25@ 1.65	1.25@ 1.60
Hazard (Ky.) block.....	Chicago.....	2.50@ 2.75	2.50@ 2.75	2.50@ 2.75	2.50@ 2.75
Hazard (Ky.) egg.....	Chicago.....	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85
Hazard (Ky.) slack.....	Chicago.....	.50@ .90	.50@ .90	.50@ .90	.50@ .90
Hazard (Ky.) block.....	Louisville.....	2.00@ 2.25	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50
Hazard (Ky.) egg.....	Louisville.....	1.25@ 1.50	1.30@ 1.60	1.35@ 1.75	1.35@ 1.75
Hazard (Ky.) nut-and-slack.....	Louisville.....	.50@ .65	.40@ .65	.35@ .60	.35@ .60
Hazard (Ky.) mine-run.....	Louisville.....	1.25@ 1.50	1.30@ 1.50	1.30@ 1.60	1.30@ 1.60
Hazard (Ky.) block.....	Cincinnati.....	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50	1.85@ 2.50
Hazard (Ky.) egg.....	Cincinnati.....	1.30@ 1.65	1.25@ 1.60	1.30@ 1.65	1.25@ 1.50
Hazard (Ky.) nut-and-slack.....	Cincinnati.....	.50@ .75	.40@ .60	.40@ .60	.45@ .60
Hazard (Ky.) mine-run.....	Cincinnati.....	1.10@ 1.40	1.10@ 1.35	1.10@ 1.35	1.10@ 1.40
Elkhorn (Ky.) block.....	Chicago.....	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50
Elkhorn (Ky.) egg.....	Chicago.....	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Elkhorn (Ky.) slack.....	Chicago.....	.85@ 1.25	.85@ 1.25	.85@ 1.25	.85@ 1.25
Elkhorn (Ky.) block.....	Louisville.....	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50	2.00@ 2.50
Elkhorn (Ky.) egg.....	Louisville.....	1.40@ 1.60	1.40@ 1.60	1.50@ 1.75	1.35@ 1.75
Elkhorn (Ky.) nut-and-slack.....	Louisville.....	.60@ .75	.50@ .75	.50@ .75	.40@ .75
Elkhorn (Ky.) mine-run.....	Louisville.....	1.40@ 1.60	1.35@ 1.50	1.40@ 1.60	1.40@ 1.60
Elkhorn (Ky.) block.....	Cincinnati.....	1.75@ 3.50	1.75@ 3.50	2.00@ 3.50	2.00@ 3.50
Elkhorn (Ky.) egg.....	Cincinnati.....	1.35@ 2.00	1.35@ 1.75	1.35@ 1.85	1.30@ 2.00
Elkhorn (Ky.) nut-and-slack.....	Cincinnati.....	.50@ .75	.50@ .75	.50@ .75	.50@ .75
Elkhorn (Ky.) mine-run.....	Cincinnati.....	1.15@ 1.65	1.15@ 1.65	1.10@ 1.60	1.10@ 1.65
Kansas shaft lump.....	Kansas City.....	3.75	3.75	3.75	3.75@ 4.00
Kansas strip lump.....	Kansas City.....	3.00	3.00	3.00	3.00@ 3.25
Kansas mine-run.....	Kansas City.....	2.50	2.50	2.50	2.50
Kansas screenings.....	Kansas City.....	1.50	1.50	1.50	1.50

WHAT'S NEW

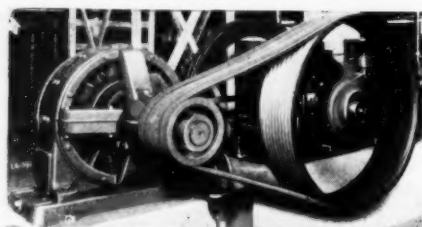
IN COAL-MINING EQUIPMENT



V-Type Drive Combines Belts and Sheaves

Worthington Pump & Machinery Corporation, Harrison, N. J., now offers the new "Multi-V-Drive," which it claims is designed to meet the demand for an efficient, economical, reliable, durable, and simple means of power transmission. The equipment consists of a number of endless, molded V-belts running in V-grooved sheaves. Good-year "Emerald Cord" belts are used, and are said to provide, in the correct ratio, high power capacity, long flexing life, low stretch, and accurate cross-section. Load-carrying members, it is claimed, are high-grade cotton cords arranged in parallel rows and concentrated about the neutral axis. The rubber, the company points out, is of the highest quality, and each of the belts takes an equal share of the transmitted load.

Each sheave, according to the manufacturer, is carefully grooved, machined



Worthington "Multi-V-Drive"

and finished so that the grooves present a smooth surface for the belts to run on. The wedging action between the belts and grooves, it is claimed, results in a slipless, powerful grip, which compensates for, but differs from, initial belt tension in a flat belt drive. Effective conformity of the belt to the sheave, which assures maximum power transmission efficiency, has been secured, it is stated, by an exact mathematical relationship between the grooves and the shape of the V-belt. The combination is said to give a positive grip without binding or backlash, and to transmit 99 per cent of the power at high speed ratios over short centers without the use of idlers.

Another feature pointed out by the manufacturer is that each application is so engineered that, should one of the belts be ruptured, the remaining belts will carry the load until replacement can be made. Advantages of the "Multi-V-

Drive," as set forth by the company, are high efficiency, long life, negligible maintenance, quiet operation, neatness, small floor space required, constant speed, elimination of idlers, lubrication, and belt dressing; higher speed ratios, and freedom from breakdown.

Power Reamer Developed

To eliminate hand reaming on 4-in. and larger size pipe, the Oster Mfg. Co., Cleveland, Ohio, has developed the No. 414 power reamer. It is equipped with three reamer blades, and the company points out that the screw feed is so designed that tremendous pressure is exerted by the blades, eliminating, it is said, the necessity for pushing against the tool to do a thorough reaming job.

The Oster company also announces a new three-way threader for $\frac{3}{8}$ -, $\frac{1}{2}$ -, and $\frac{3}{4}$ -in. pipe, said to cut a standard thread length on a pipe as close as $4\frac{1}{2}$ in. to the wall. This machine, designated as the No. 000 "Chip Chaser," is small and light; equipped with $\frac{3}{4}$ -in. handle, exceptionally comfortable for the user; is evenly balanced; and cuts a perfect thread on any of the three sizes of pipe for which it is designed, according to the manufacturer.

On the portable bench-type pipe threader, the Oster company says that it has equipped it with a universal electric motor to speed up production and eliminate any stalling. This results from the fact that the speed of the motor is in direct proportion to the speed of the die, it is claimed. The company also announces that this machine, called the "Willie Williams," can be furnished in either the bench or pedestal types.

Packing Said to "Disrupt" In Stuffing Box

"Cordex," a new packing said to disrupt after being placed in the stuffing box has been brought out by Metalastic, Inc., Union City, N. J. It is composed, the company says, of metal particles, asbestos fiber, binder, and a specially prepared lubricant, incased in a thin shell of viscous material. It comes in straight rods, 18 in. in length, and, according to the manufacturer, is wrapped around the rod or shaft, inserted in the stuffing box, and the gland drawn up

In use, the casing disrupts and the packing creates a perfect seal and bearing, it is claimed.

The new packing is said to have all the advantages of the loose form of semi-metallic packing, and at the same time eliminates the neck ring, as well as overcoming the difficulty sometimes experienced in getting the loose form of packing into the stuffing box. Other features outlined by the maker are: it fits any stuffing box; does not harden in the stuffing box; is always elastic and furnishes a perfect bearing surface for rods and shafts; is easily cut with knife, shears, or snippers; there is no waste in use; it is self-lubricating; and does not wear, bind, or score the rods. It may be used, the company says, in connection with steam, water, oil, gas, hot or cold air, ammonia, alcohol, brine, and acids.

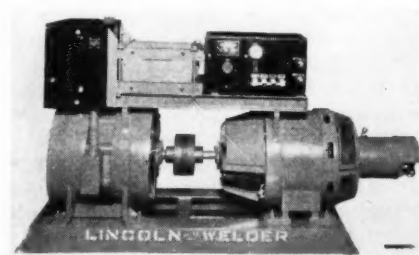
Brattice Is Adjustable

An adjustable, pneumatic brattice for use in combating mine fires is offered by E. D. Bullard Co., San Francisco, Calif. Individually constructed brattices have been in use for a number of years, the Bullard company points out, but in each case it is necessary to collect the materials, construct the brattice under unfavorable conditions, and shoulder an excessive cost. The new equipment offered, the company says, embodies the best principles of the pneumatic brattice, and is light, easily handled, quick and simple to erect, and efficient in preventing the passage of air.

Larger Welder Announced

A new welder with a rating of 600 amp. has been developed by the Lincoln Electric Co., Cleveland, Ohio, for use with large-size metallic and carbon electrodes which require higher welding currents. It may be secured

Lincoln Electric Welder



What's NEW in Coal-Mining Equipment

in either the portable or stationary truck types. Construction details, as outlined by the manufacturer, follow:

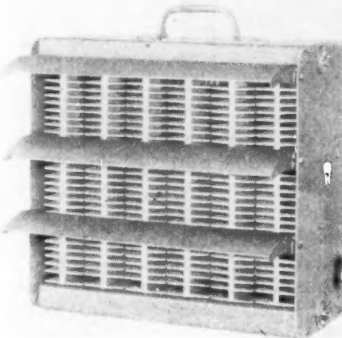
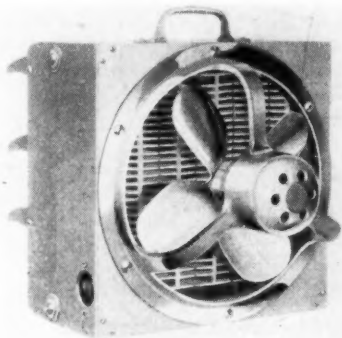
The welder is of the motor-driven, single-operative, variable-voltage type, with a current range of from 180 to 750 amp. Motor and generator are direct-connected. The working mechanism of all controls is contained in an inclosed, ventilated, steel cabinet, with hand regulators and switches mounted on a panel which forms a side of the cabinet. The control panel contains the rheostat, diverter switch, safety starter switch, volt-ammeter, and wing-nut terminals for cable. This unified control simplifies operation. The control cabinet is mounted directly over the motor-generator set, where it is easily accessible to the operative and at the same time allows the armature to be removed without difficulty.

Use of a combined voltmeter and ammeter makes possible the reading of voltage and amperage on one dial and eliminates the separate delicate ammeter. The wing-nut cable terminals allow quick and easy connections, especially when it is desired to reverse the polarity of the machine and eliminate the necessity of a switch for reversing polarity.

Electric Space Heater Offered

An electric space heater for industrial and commercial heating needs has been developed by the American Foundry Equipment Co., Mishawaka, Ind. The unit is said to combine the characteristics of both the steam unit heater and the electric heater. Special alloy heating strips are cast integrally with com-

Electric Space Heater



posite fins of aluminum alloy, making a smooth casting that will allow an uninterrupted flow of air through its channels, the company says. The castings are then assembled into a cabinet, back of which a fan operates to drive the air through the heated fins out into the space where the heat is desired. The heater may be used for a permanent or portable installation, and is especially applicable, the company declares, for heating isolated or temporary buildings, intermittent needs, "off-season" heating, replacing impracticably applied stoves, and for plants generating their own power or where the power rate is low.

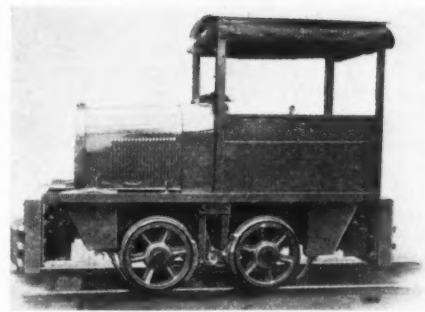
Resistance to Wear Claimed For Rubber Product

Wilkinson Process Rubber Sales Corporation, Chicago, now offers "Linatex," a rubber for industrial, mining, and engineering uses. The chief characteristic of this new product, according to the company, lies in the process of manufacture. Where other rubbers of commerce are, with the addition of sulphur, vulcanized under heat and pressure, "Linatex," it is claimed, is vulcanized at atmospheric temperatures in the latex solution, utilizing the sulphur already present and without employing pressure. The resulting product according to the company, is non-aging, has a remarkable resistance to abrasion and great resiliency, and retains all the natural properties of rubber.

The unusual resiliency of the material, the company declares, is an important advantage. When used as a wear-resisting material, particles of material, upon striking "Linatex," rebound instead of sliding along the surface, with consequent wear. This same property, the company states, makes "Linatex" suitable for use in skips and other conveyances where self-cleaning is desired. It also acts to prevent wear when the material is used in lining pipes, troughs, or launders which carry abrasive material. "Linatex," the maker says, may easily be cut, formed, cemented, and joined to steel or wood, and is unaffected by chemicals used in mining or weak acids and alkalis, as well as by long exposure to atmospheric conditions.

Locomotives Have Ford Engine

The new Ford "AA" truck power plant is used in new locomotives for light haulage which the Brookville Locomotive Co., Brookville, Pa., has developed in 2, 2½, 3, 3½, and 4-ton sizes. Maximum mobility and power are attained with a minimum of motor effort and wear, the company says, by the use of the four-speed, heavy-duty, Ford transmission in conjunction with a Brookville reverse drive. The latter unit, it is declared, makes all four forward speeds available in either direction.



Brookville, Ford-Powered Locomotive

In low gear, according to the manufacturer, the Ford motor is sufficiently powerful to slip all four wheels of the 4-ton machine when equipped with steel tires and operating on a dry, sanded rail. In addition, the company says, the locomotive will attain a speed of 15 m.p.h. under full load, and will negotiate light tracks without derailment, due to the use of Brookville spring journals and wide wheels with deep flanges. As the entire Ford power plant, including clutch and transmission, is used complete, the manufacturer points out that inexpensive and expert service is available from all Ford dealers.

Heavy-Duty Crane for Use Indoors or Outdoors

A heavy-duty crane, said to be suitable for indoor or outdoor use, has been placed on the market by the Trojan Engineering Co., New York City. According to the manufacturer, its capacity is 3,650 lb. 2 ft. from the end of the chassis and 750 lb. 14 ft. from the end of the chassis. The boom is telescopic over a distance of 6 ft. Maximum lift, it is stated, is 17½ ft., and the machine can pass through doors as low as 6 ft. when the boom is lowered.

Boom and hook are operated independently from separate motor-driven hoists. Separate motors for each of the four wheels are said to give traction at all times, regardless of which pair is carrying the weight. Short turning radius, the company states, allows loads to be swung about a point only 2 in. from the side of the truck. Power is supplied by a storage battery, said to be large enough to operate an electric magnet in addition to performing the propelling and hoisting duties. Applications of the equipment, it is pointed out, are in large machine shops, material yards, and other places where it is necessary to have a long reach both horizontally and vertically.

Brattice Cloth Is Fireproof

E. I. duPont de Nemours & Co., Wilmington, Del., are now offering a new line of brattice cloth, including coated and uncoated fabrics, said to be designed especially for maximum service in

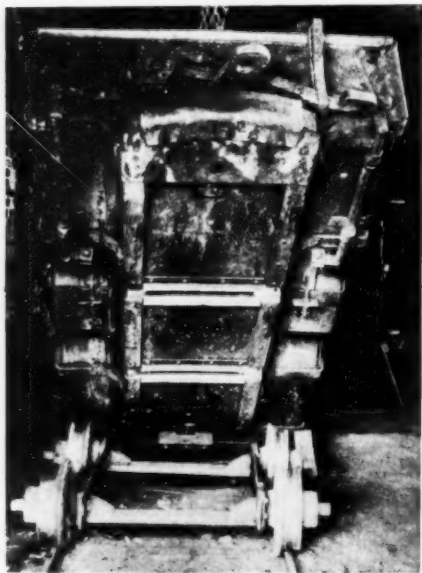
What's NEW in Coal-Mining Equipment

underground usage. The coated cloth may be obtained with either a duck or jute base. The jute cloth comes in four grades, three treated to make them fire-resistant. Three different weights also may be secured. Features of the coated grades emphasized by the company are: air-tightness, which allows delivery of the maximum quantity of air at the working face and eliminates leakage dangers; moisture-resisting qualities, preserving the flexibility and easy handling of the cloth; resistance to mechanical wear, and, where fire-resisting treatment is given, prevention of leaching, which would destroy that quality. In addition to the coated materials, there also is available a complete line of uncoated cloth, all treated to make it fire-resistant.

High Capacity Claimed For Mine Car

Larger capacity for a given bottom clearance and over-all dimensions is the principal feature claimed for a new mine car designed by A. R. Long, superintendent, New River Co., Scarbro, W. Va., and manufactured by the Watt Car & Wheel Co., Barnesville, Ohio. The car, which is 28 in. high, 5 ft. wide, and 10 ft. long, has the usual track clearance. On the other hand, the designer claims that it has an additional capacity of 5 cu.ft., and that it is so constructed that there are fewer corners to encourage voids.

The design is unusual, it is claimed, in that the truck is detachable from the



Car With Truck Detached, Showing Construction

body as a unit by loosening four bolts, and that the axles can hardly be classed as the drop or stub type. As shown in the accompanying illustration, a square washer is shrunk onto the axle, which also is square, and the washer in turn

is welded to a 1x6-in. crossbar which extends from side to side under the car body. Practically all the weight is carried on these washers, which are relatively close to the rail, thus reducing the bending moment on the crossbar. The bending also is minimized by the fact that the side plates running between the front and rear axle assemblies are braced apart by the car body.

The crossbars connecting the axles rest in slots formed by angles riveted to the bottom of the car. Pockets also are cut in the body of the car at the ends of the slots to receive the sloped ends of the square axles and prevent movement of the axle assemblies either backward or forward. Four bolts, one for each wheel, extend through slotted holes in the body and corresponding holes in the side plates running between the front and rear axle assemblies to hold the trucks to the body. Use of slotted holes in the body allow an up-and-down movement of about $\frac{1}{4}$ in., which, according to the designer, provides the flexibility



Inside View of Car

necessary to prevent derailments on rough tracks.

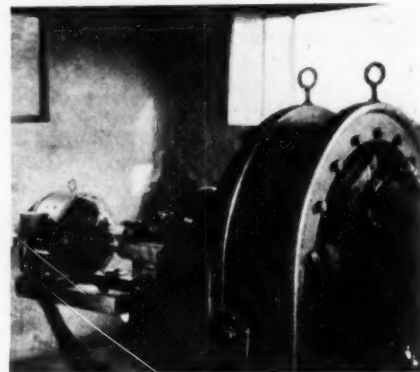
An inside view of the car is shown in an accompanying illustration. This emphasizes the minimum loss of space claimed by the company. The only breaks in the smooth bottom of the body are the combination wheel covers and side braces. The coal-carrying space extends down to within $1\frac{1}{8}$ in. of the bottom clearance line, and the sides of the bottom space are within $1\frac{1}{2}$ in. of the wheel hubs.

Large Saving Claimed for Power Factor Control

Automatic power factor control for synchronous motor-generator sets is being marketed by the Melton Control Co., Punxsutawney, Pa. The method, which is patented, embodies the use of an exciter which, without the use of relays, solenoids, or series torque motors, adjusts without steps the synchronous motor field current in proportion to the load.

It is claimed that with this equipment the power factor will remain practically fixed at an adjusted value through variations from no load to 100 per cent overload. The effect is to increase the motor generator capacity by increased ability to carry peak or surge loads, and

by reduced heating on average loads; to avoid penalty or afford premium where the power contract contains a power factor clause; to increase the capacity of transformers and lines; to decrease demand charges based on kva.; to re-



Power Factor Control Exciter Installed

duce power cost by increasing efficiency of the motor generator; to decrease a.c. voltage drop; and, in special cases, to eliminate surging or hunting of the power unit.

Locomotive for Low Coal Work Has Removable Battery Box

For operators with thin seams of coal, the Mancha Storage Battery Locomotive Co., St. Louis, Mo., offers a new low-type battery locomotive which can be secured with permissible features. According to the manufacturer, the battery box is removable, allowing the locomotive to be kept in continuous operation by providing sufficient battery capacity. In addition to the unlimited battery capacity stressed by the company, low over-all height is claimed, making the equipment especially suitable for use in low coal.



Low-Type Mancha Locomotive With Removable Battery Box

The locomotive is powered by a single motor, with gear drive only. The gear assembly is mounted in a housing on one axle, and is driven directly from the motor armature shaft. Axles are connected by a chain and sprockets. Cross equalizers can be installed if required, the manufacturer states, and Mancha transfer equipment can be supplied for handling the removable battery. The locomotive frame is of cast annealed steel, which the company claims is practically indestructible. Weight with battery is 6 to 8 tons.